Software - User manual

PVM-21

PVM-21 Software - User manual

Version 1.03

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Thank you for using the PVM-21 system.
In this document we will introduce you to the PVM-21 Software.

Basics:

The Software is based on user defined database.
This Database contains not only the measured input values, but also user defined information and additional information of the series of measurements.
Through the user configured database, the software is able to be adapt to the user's special requirements.

As you enter more data sets in the Software, you will become more familiar with the software operation. At first you have to spend a little more time to create a database. After a while you will see the advantages of the software and your customized database.

Quickstart:
Info:

The following introduction needs about 20 minutes of your time. After that you will understand the software basics.

Please start by reading the Software installation manual. Install the software.

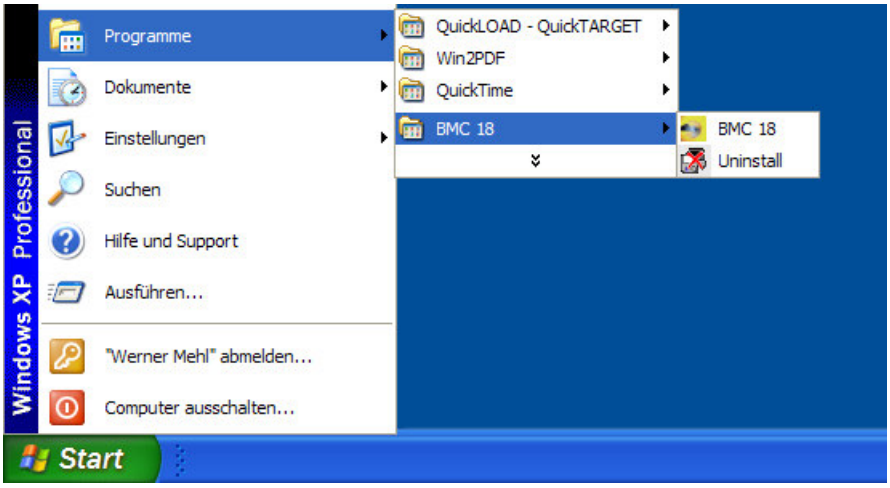
After the software is installed on your computer and you ready to connect the PVM-21 for the first time to the USB interface of your computer, please read the USB driver installation manual and follow the prompts.

Remember, the PVM-21 is a precision measuring instrument. Always follow the suggested operating instructions. Doing so will insure years of reliable and accurate service.

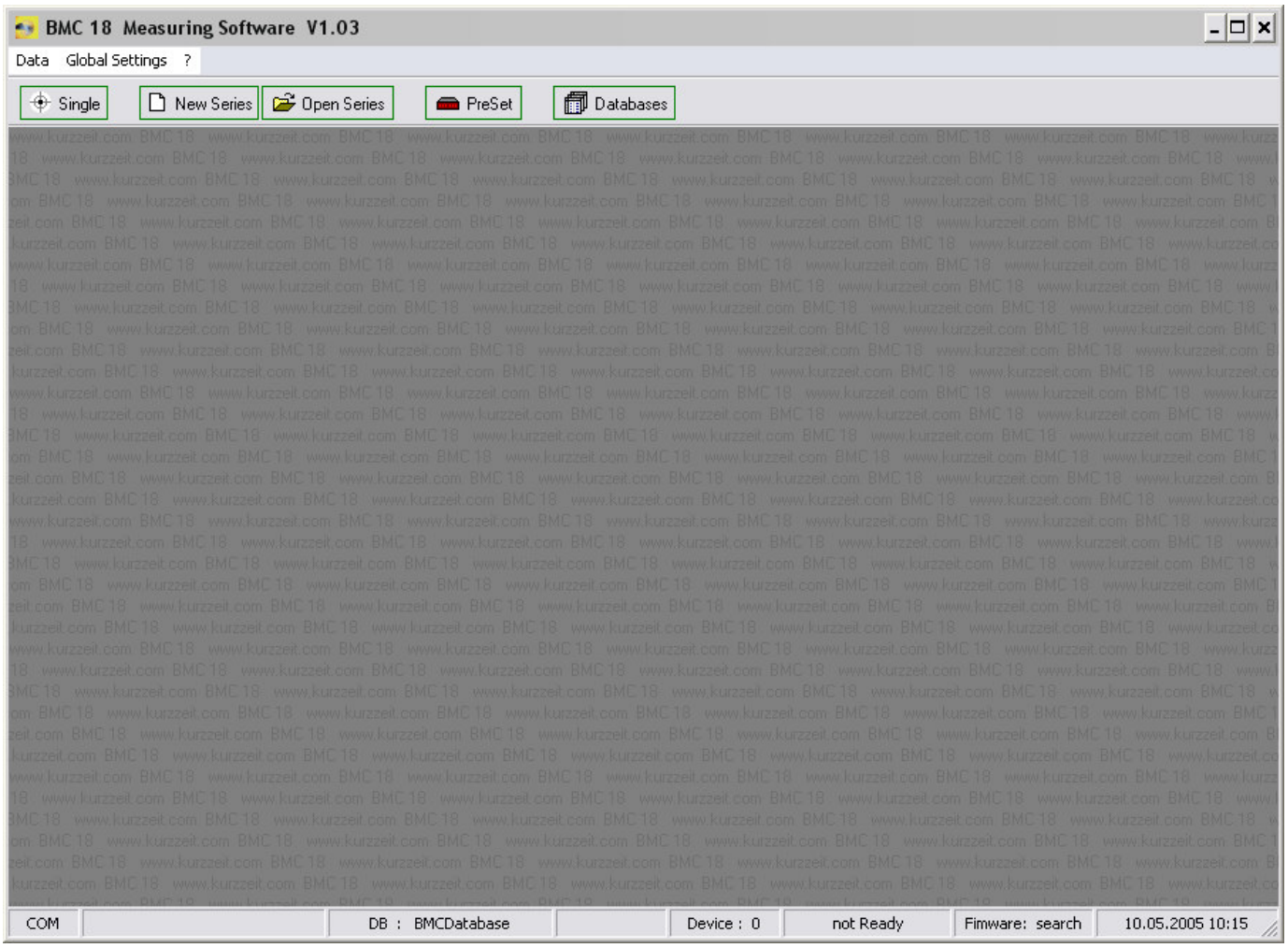
Always follow the commandments of firearm safety. Be aware of your surroundings at all times when making measurements. Be aware of your target and the direction of the muzzle of the firearm. Changing your concentration from the target to instrument must be done with safety in mind.
Place the lightscreen at a distance that will allow you to shoot through the screen with assurance that you will not "kill" the lightscreen. Never place the lightscreen closer than 2 meters or 7 feet.

With the PVM-21 connected to your computer, a Virtual Com Port VCP is installed. This VCP is needed for the data transfer between the PVM-21 and your computer.

Important note: Do not disconnect the PVM-21 from the PC while Software has connection to the PVM-21. After that a Software restart is a must to reconnect the PVM-21 with the Software. Also you have to connect the PVM-21 to the USB Port before starting the Software. The VCP is activated only when the PVM-21 has a connection to the PC. For more information, please refer to the appendix.



After starting the PVM-21 software, the Program Window appears on the Desktop.

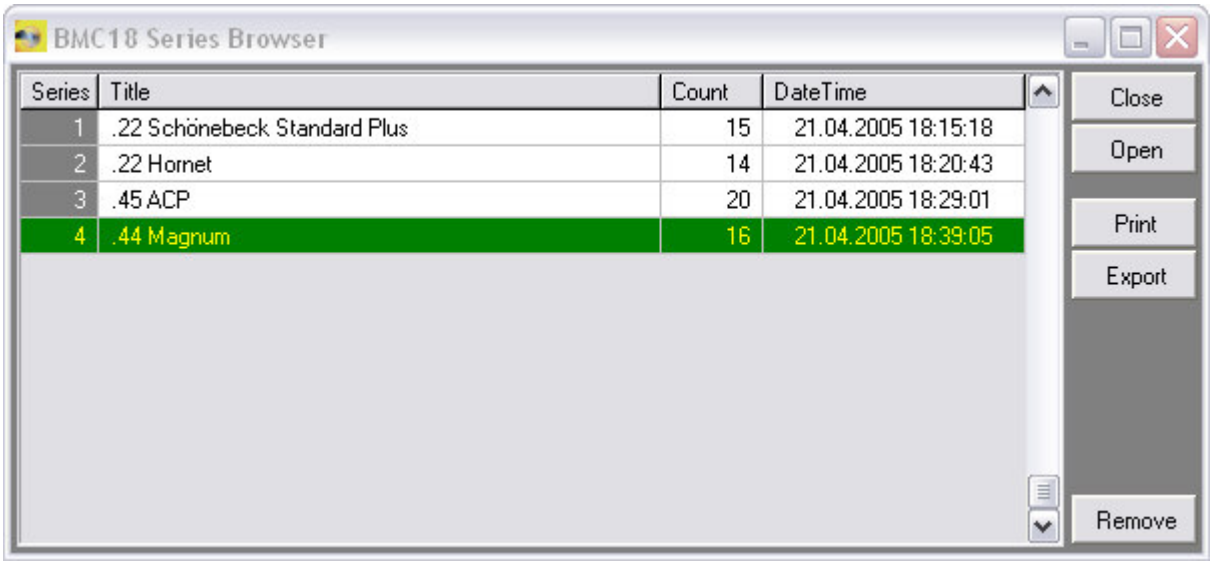


In the lower left corner the Com Port in use is shown.

Until the PVM-21 is properly connected, two fields in the status line are blinking red (**COM** and **NOT READY**).

Some seconds after a PVM-21 has been connected, the Software will establish a connection to the PVM-21. The status bar changes to green and the PVM-21 is ready for measurement.

Now open the Series Browser with the "**Open Series**" button. A new window with the available series appears.



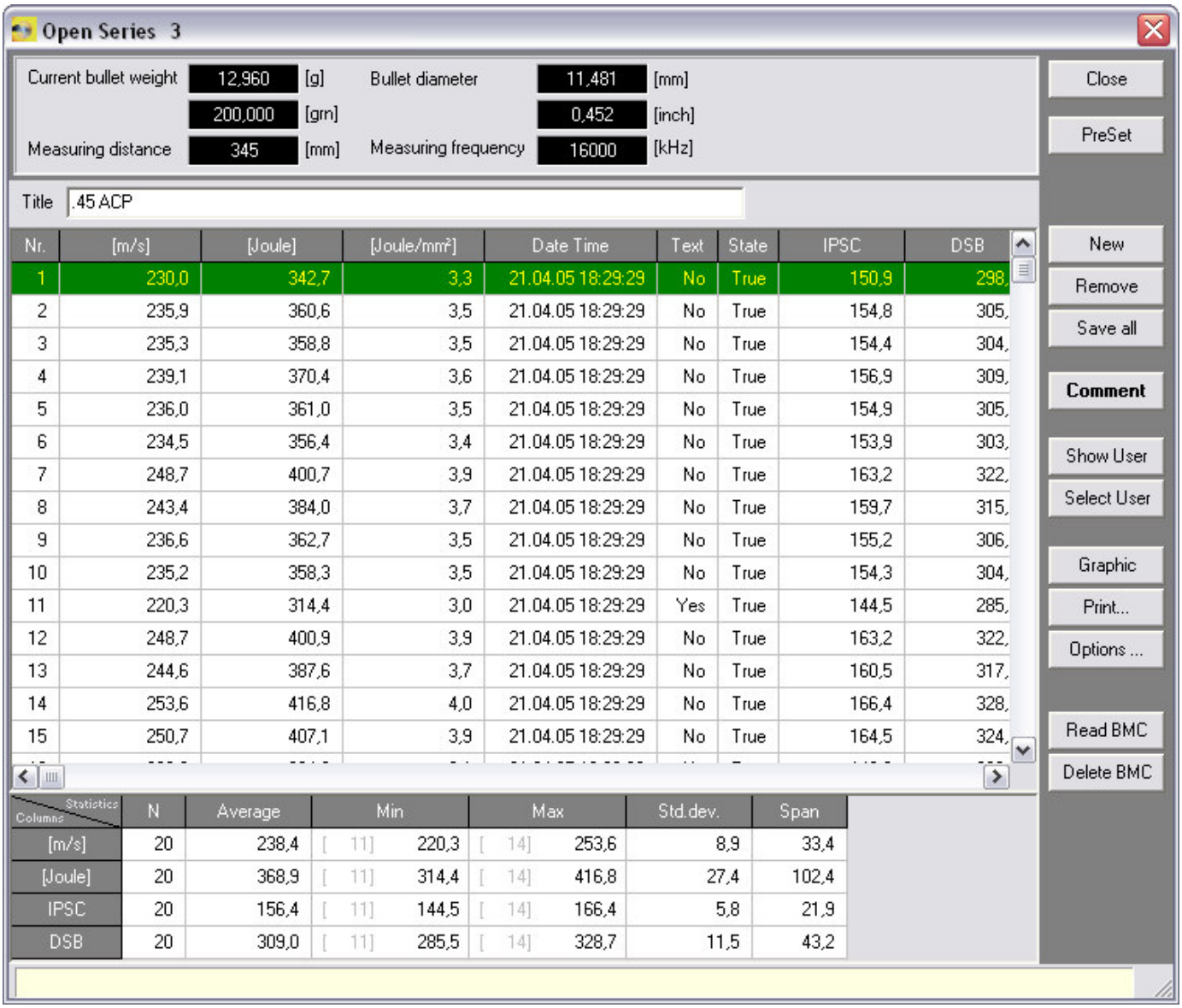
The Table contains the following rows:

Series :	The consecutive series numbering
Title:	The name, the user has designated for this series
Count:	Measuring value count in this series
Date Time:	Date Time of last saving this series

Important note: In most of the tables shown in this software, you can open more features by clicking the rows with the right mouse key.

Now select the "**Series 3**" ,e.g. ".45 ACP" with a double click or click the „Open Button" of the Series Browser.

The selected series appears in a new window.



Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State	IPSC	DSB
1	230,0	342,7	3,3	21.04.05 18:29:29	No	True	150,9	298,
2	235,9	360,6	3,5	21.04.05 18:29:29	No	True	154,8	305,
3	235,3	358,8	3,5	21.04.05 18:29:29	No	True	154,4	304,
4	239,1	370,4	3,6	21.04.05 18:29:29	No	True	156,9	309,
5	236,0	361,0	3,5	21.04.05 18:29:29	No	True	154,9	305,
6	234,5	356,4	3,4	21.04.05 18:29:29	No	True	153,9	303,
7	248,7	400,7	3,9	21.04.05 18:29:29	No	True	163,2	322,
8	243,4	384,0	3,7	21.04.05 18:29:29	No	True	159,7	315,
9	236,6	362,7	3,5	21.04.05 18:29:29	No	True	155,2	306,
10	235,2	358,3	3,5	21.04.05 18:29:29	No	True	154,3	304,
11	220,3	314,4	3,0	21.04.05 18:29:29	Yes	True	144,5	285,
12	248,7	400,9	3,9	21.04.05 18:29:29	No	True	163,2	322,
13	244,6	387,6	3,7	21.04.05 18:29:29	No	True	160,5	317,
14	253,6	416,8	4,0	21.04.05 18:29:29	No	True	166,4	328,
15	250,7	407,1	3,9	21.04.05 18:29:29	No	True	164,5	324,

Statistics / Columns	N	Average	Min	Max	Std.dev.	Span
[m/s]	20	238,4	[11] 220,3	[14] 253,6	8,9	33,4
[Joule]	20	368,9	[11] 314,4	[14] 416,8	27,4	102,4
IPSC	20	156,4	[11] 144,5	[14] 166,4	5,8	21,9
DSB	20	309,0	[11] 285,5	[14] 328,7	11,5	43,2

You can see the list of measurement values of the series 3 ".45 ACP".

In the upper area of the series window you can see six (6) black fields. In these fields the software shows the basic settings.

Current bullet weight: Selected bullet weight in gram and grain
Bullet diameter: Bullet diameter in millimeter and inch
Measuring distance: * The lightscreen measuring base in mm (metric millimeter)
Measuring frequency: * The PVM-21 measuring frequency in kHz

Thereunder is the series title, named by the user.

*** Note: These settings can't be changed by the user!**

The list with the measurement values follows.

Title .45 ACP

Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State	IPSC
1	230,0	342,7	3,3	21.04.05 18:29:29	No	True	150,9
2	235,9	360,6	3,5	21.04.05 18:29:29	No	True	154,8
3	235,3	358,8	3,5	21.04.05 18:29:29	No	True	154,4
4	239,1	370,4	3,6	21.04.05 18:29:29	No	True	156,9
5	236,0	361,0	3,5	21.04.05 18:29:29	No	True	154,9

The rows contains the following information:

Nr. The consecutive measuring values number
m/s The measured speed in meter per second
Joule The bullet energy in Joule
Joule/mm² The bullet energy in Joule per mm² bullet cross section
Date Time Date and time, the measuring has been captured
Text **No** shows that no comment to this value has been deposed.
Yes shows that a comment to this value has been deposed.
State **True** shows, that this value is used in the series statistics
False shows, that this value **is selected as false and is not** used in the series statistics

Click with the mouse to the **No** of the first value. The following window appears:

If you want you can write a comment with maximum 255 characters length into this window.

When you press **OK**, the comment is stored in the series and you can see in the row "Text" that the **No** has been changed to **Yes**.

Title .45 ACP

Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State	IPSC
1	230,0	342,7	3,3	21.04.05 18:29:29	Yes	True	150,9
2	235,9	360,6	3,5	21.04.05 18:29:29	No	True	154,8
3	235,3	358,8	3,5	21.04.05 18:29:29	No	True	154,4
4	239,1	370,4	3,6	21.04.05 18:29:29	No	True	156,9
5	236,0	361,0	3,5	21.04.05 18:29:29	No	True	154,9

Yes indicates that a comment is now available.

By selecting a "**TRUE**" value in the State Row of a measurement value, you can set the value as "**FALSE**".

The background of the complete line becomes light gray. The value becomes an invalid state and is no longer calculated within the statistics.

Title .45 ACP

Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State	IPSC
1	230,0	342,7	3,3	21.04.05 18:29:29	Yes	True	150,9
2	235,9	360,6	3,5	21.04.05 18:29:29	No	True	154,8
3	235,3	358,8	3,5	21.04.05 18:29:29	No	False	154,4
4	239,1	370,4	3,6	21.04.05 18:29:29	No	True	156,9
5	236,0	361,0	3,5	21.04.05 18:29:29	No	True	154,9
6	234,5	356,4	3,4	21.04.05 18:29:29	No	True	153,9

Clicking again the "**FALSE**" marked value in the **STATE** row toggles the value to "**TRUE**" again.

Below the series list you can see the statistic calculations. By clicking a value from "**TRUE**" to "**FALSE**" or otherwise you can see the effect of removing the value from the list immediately.

Statistics / Columns	N	Average	Min		Max		Std.dev.	Span
[m/s]	20	238,4	[11]	220,3	[14]	253,6	8,9	33,4
[Joule]	20	368,9	[11]	314,4	[14]	416,8	27,4	102,4
IPSC	20	156,4	[11]	144,5	[14]	166,4	5,8	21,9
DSB	20	309,0	[11]	285,5	[14]	328,7	11,5	43,2

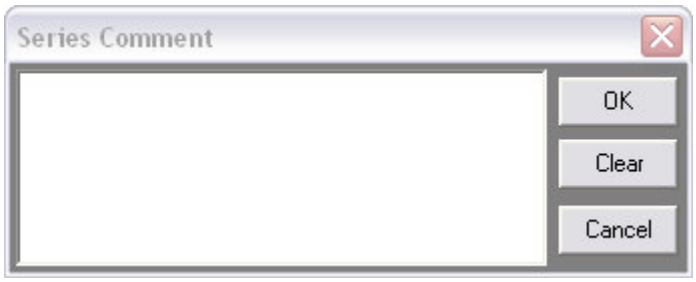
N Number of measurement valid ("TRUE") values in this series
Average Mean value of the valid values in this series
Min. Minimum value of the valid values in this series
Max. Maximum value of the valid values in this series
Std. Dev. Standard deviation of the valid values in this series

On the right side of the series window you can see the following functions (Buttons).

Close	Close this Window
Preset	Light screen amplifier adjustments
New	Open new series
Remove	Remove all marked values
Save all	Save the whole series
Comment	Opens a comment window for the „series comment“
Show user	Shows the database assignments to the opened series
Select user	Assign new database entries to the opened series
Graphic	Shows the active series as a diagram
Print	Opens a selection of print forms
Options	Settings for the remote display and network management
Read BMC	Reads data from a connected PVM-21
Delete BMC	Deletes all stored values in the connected PVM-21

The Button "**No Comment**"at the right side of the window shows the user that no series comment has been entered.

Click the Button "**No Comment**" and enter a comment in the "**COMMENT**" window.



After you have stored the comment with the **OK** Button, you can see that the "**No Comment**" Button has changed to "**Comment**". This indicates that a series comment is available.

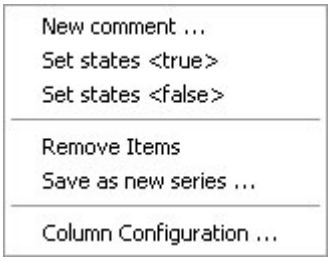
More functions while working with tables

Sample: Set the mouse cursor to the second (2.) measurement value. Hold down the left mouse button and move the mouse cursor to the fourth (4.) measurement value. Now release the left mouse button and the measurement values 2, 3 and 4 are selected.1

Title .45 ACP

Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State	IPSC
1	230,0	342,7	3,3	21.04.05 18:29:29	Yes	True	150,9
2	235,9	360,6	3,5	21.04.05 18:29:29	No	True	154,8
3	235,3	358,8	3,5	21.04.05 18:29:29	No	True	154,4
4	239,1	370,4	3,6	21.04.05 18:29:29	No	True	156,9
5	236,0	361,0	3,5	21.04.05 18:29:29	No	True	154,9
6	234,5	356,4	3,4	21.04.05 18:29:29	No	True	153,9

Put the mouse cursor into the selected area and click the right mouse button. The following menu appears:



New Comment Create a comment for the selected measurement values
Set States <True> Sets the state of the selected measurement values to „TRUE"
Set States <False> Sets the state of the selected measurement values to „FALSE"
Remove items Deletes the selected values finally! (after saving the series)
Save as new series Saves the selected values as a new series and removes the values from the actual series
Column Configuration Opens a window with the column configurator and the formula editor. Alternatively you can open the column configuration window from the (Main menu - Data - column configuration)

Column configuration

The PVM-21 with the following default rows active:

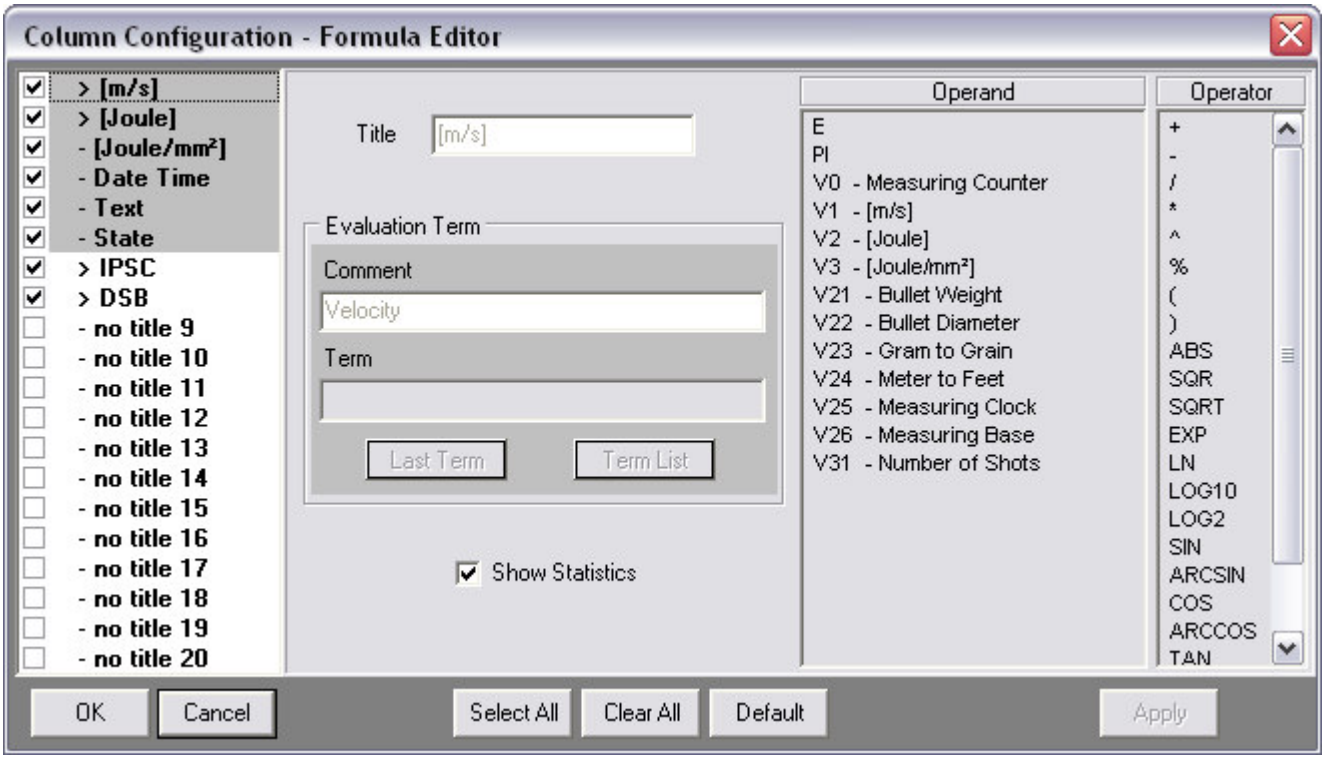
Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State	IPSC	DSB

Nr. **The consecutive numbering of the measurement values of this series**
m/s **The measured speed in meter per second**
Joule **The calculated energy in Joule**
Text **The comment for single values row**
State **The state row for the measurement values**
IPSC **The IPSC factor**
DSB **The DSB Factor (German Factor)**

It is possible, that the shown values do not fill your requirements. You may want special calculations.

The Column configuration provides you with the possibility to enhance the series calculations with a formula editor. You can create new rows in the series window with your own calculations.

The window below shows you the default configuration.

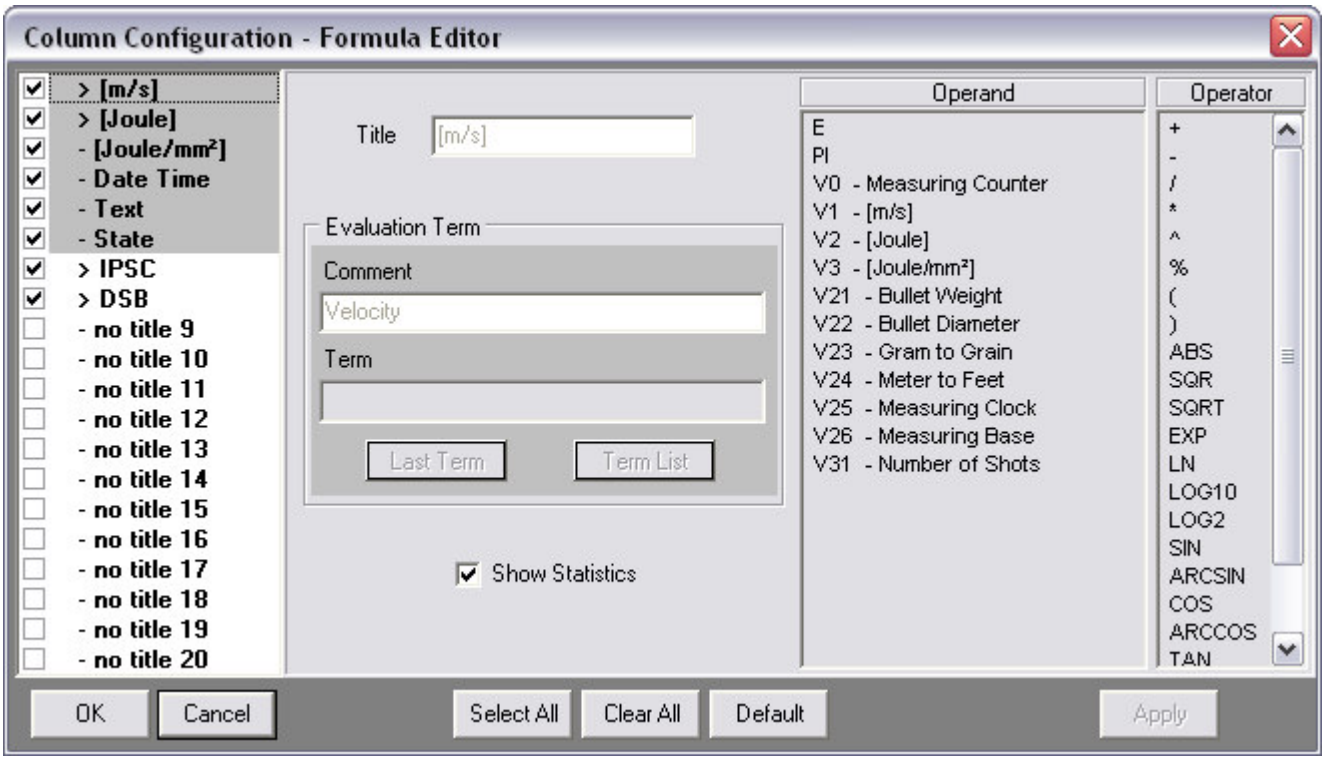


On the left side of the window you can see the (default) pre-selected values (selected with a v).
You can easily create a new row by selecting it with a v and the „Apply" button.
The first 6 values (gray background) can be selected / deselected, but not changed!

When you click on the "**Default**" button at the lower border of the window, the rows IPSC and DSB has been deactivated and the statistic has been changed.

Nr.	[m/s]	[Joule]	[Joule/mm²]	Date Time	Text	State
1	230,0	342,7	3,3	21.04.05 18:29:29	No	True
2	235,9	360,6	3,5	21.04.05 18:29:29	No	True

This is the default state of the column configuration.



Select all	select all available rows
Clear all	deselect all available rows
Default	Set the default values
Apply	Activates changes without closing the window
OK	Activates changes and closes the window
Cancel	Closes the window without changes

In the middle of the window there are three input fields:

Title	The formula title
Comment	A comment to the user formula
Term	The formula

On the right side of the Window you see the following fields

Operand	measurement values, variables and constants, you can use to create new calculations.
Operator	arithmatic functions like +, -, *, /, %, (,), ...

Sample Problem: Create a new formula, calculate the speed in feet per second.

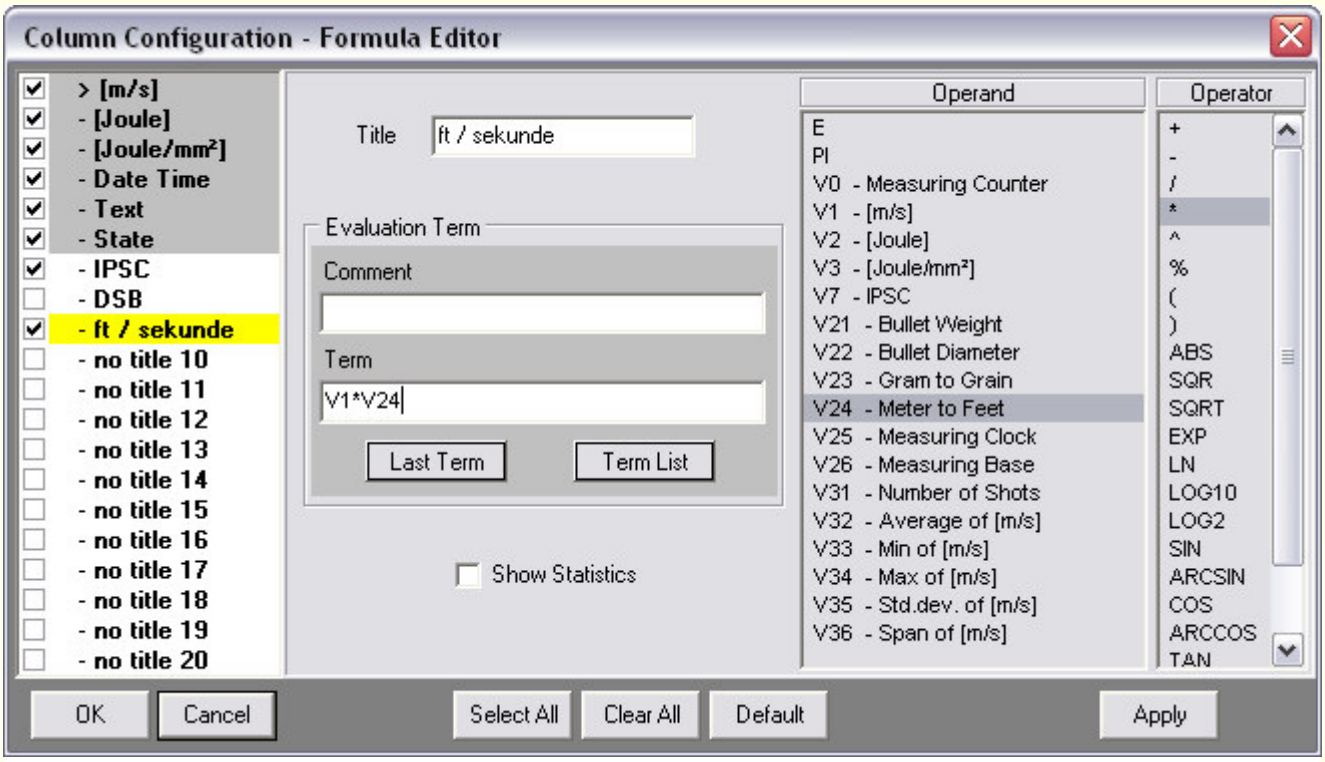
Activate the field "**no title 9**" with a **v**
Enter the text "ft/second" in the "**Title**" field. You can enter also a comment in the "**Comment**" field.

In the "Term" field we create now the new formula.

Doubleclick the variable **V1** (Measurement value in meter per second) in the **operand** section. The variable V1 appears immediately in the "**Term**" field.

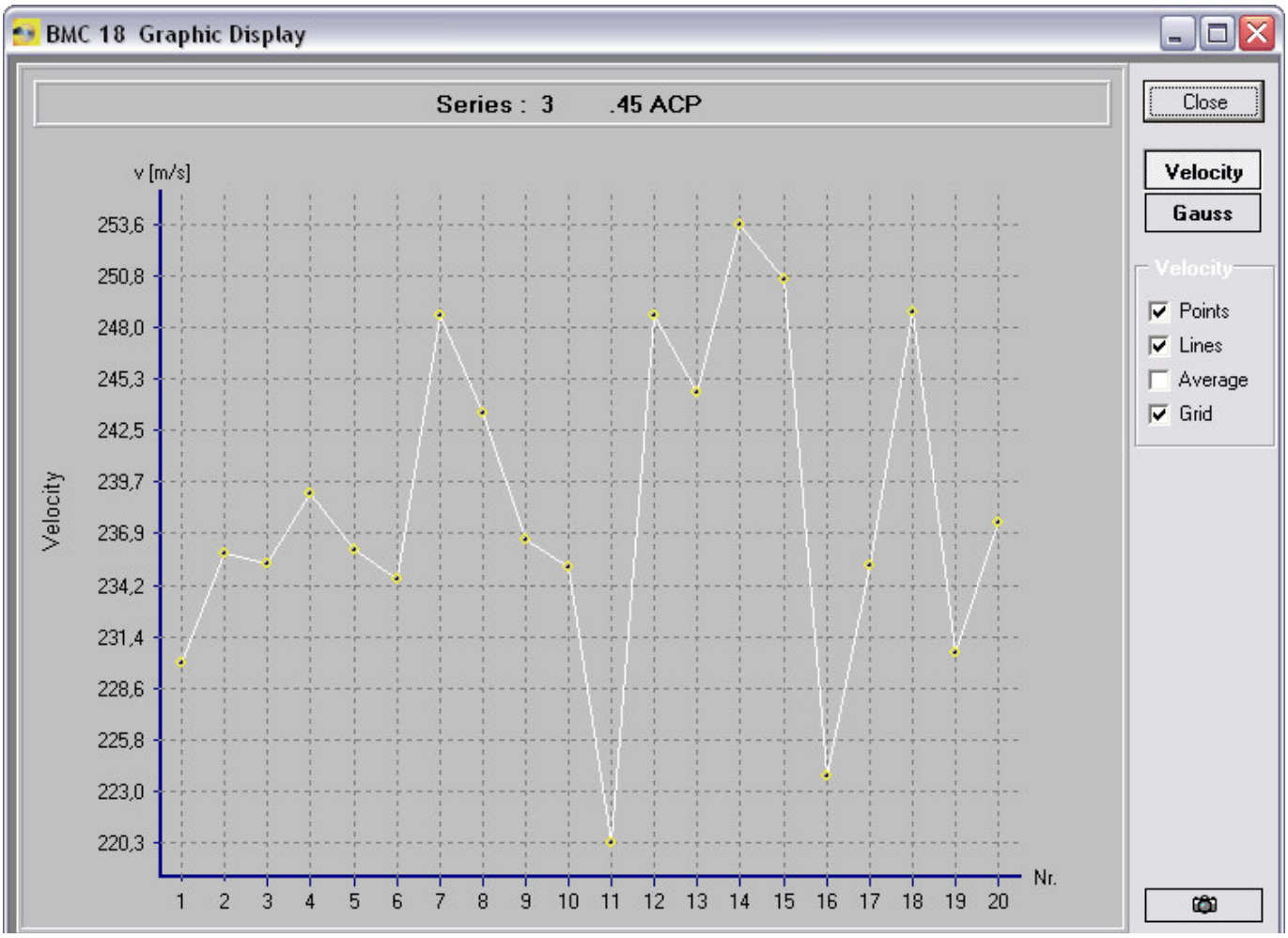
Next, doubleclick the "**operator**" * (multiplication) and then the Operand V24 (meter to feet). You can also enter the formula direct from the keyboard.

Click the apply button and see the result. You have now created a new row with the measuring results in feet per second. In the Operand area now appears your new variable "**ft/second**". This ft/second variable can be used now within new calculations.



Graphics, the series chart

A click on the "**Graphic**" button opens a new window with the series chart.

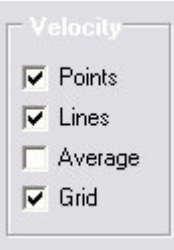


The Y-Axis shows the velocity, the X-Axis the number of the measurement value.
Every yellow point in the chart represents a measurement value. By clicking on this yellow point you can select / deselect this measurement value.
Alternatively, you can create a frame around some measurement values. Press the left mouse button and hold it down to create a frame. When the mousebutton is released, the measurement values are marked.

On clicking into the chart with the right mouse button, a menu with the following options appears:

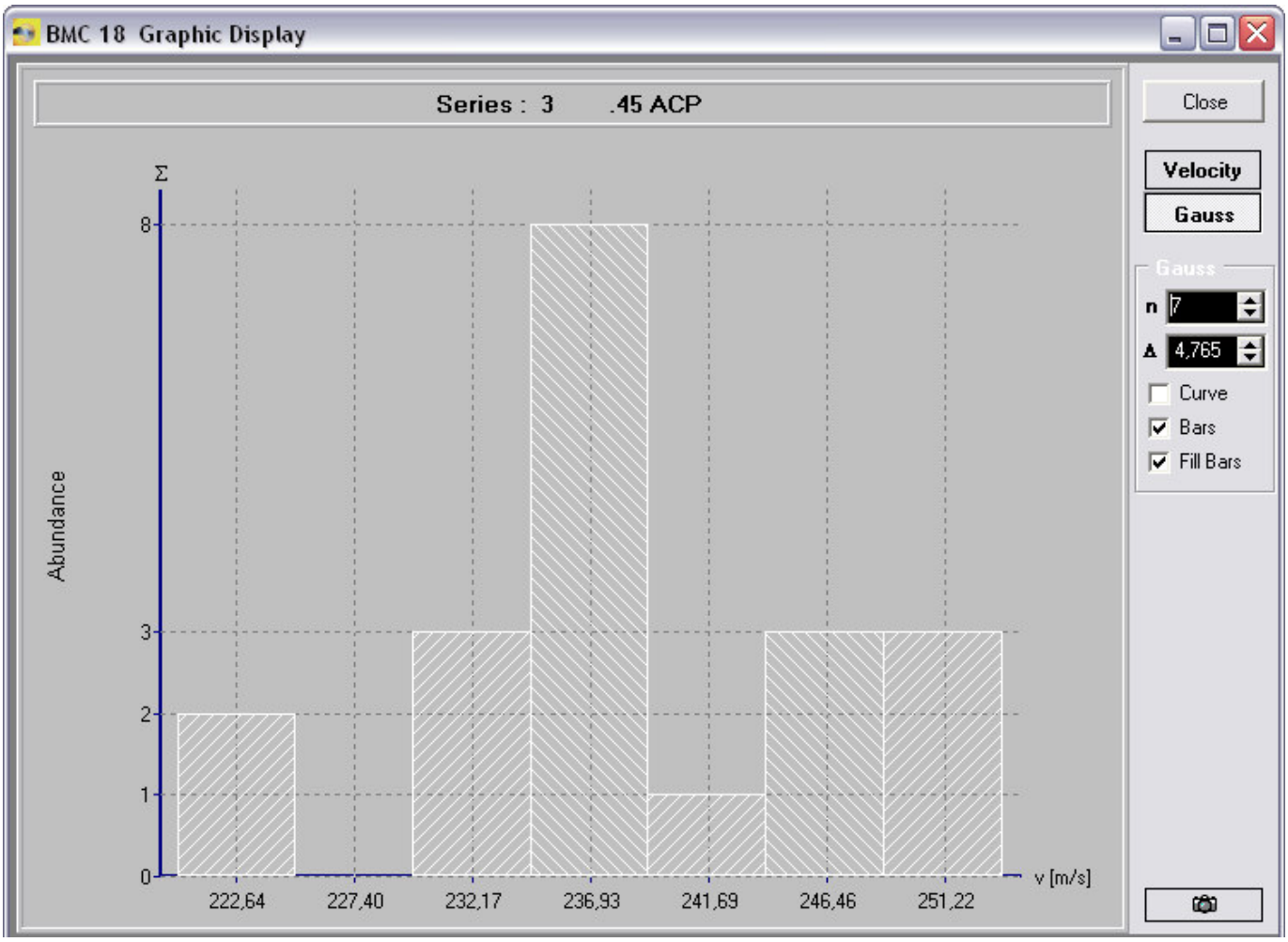
Select all	Selects all points (measurement values)
Deselect all	Deselects all points (measurement values)
Set states True	Set the state of all selected measurement values to True
Set states False	Set the state of all selected measurement values to False
Save as new ser.	Saves the selected measurement values as a new series and removes theese values from the current series.
Remove	Removes the selected measurement values from the current series.

In the "**Velocity**" area on the right side of the window you can change the chart.



Points	Activates / deactivates the dots in the chart
Lines	Activates / deactivates the lines between the dots
Average	Activates / deactivates the average line in the chart
Grid	Activates / deactivates the chart grid

With the "**Gauss**" button you can start a view to the Gauss or bar graph distribution of the current series.



The Gauss distribution can be used for sampling for quality assurance.

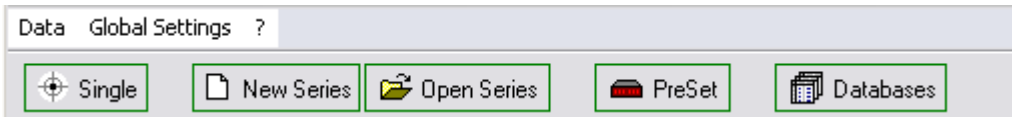
At the lower right edge of the graphic window there is the snapshot button.

By clicking to this button you can copy the graphic to the clipboard.

Using the user Database

In the delivered databases are some sample datasets. We can change them and add new ones. While working with this manual you will understand the databases and the possibilities to use the databases for your own projects.

Open the user database by clicking the button "**Databases**"



Alternatively: Open "**Data**" in the Main Menu and select then "**Databases**".

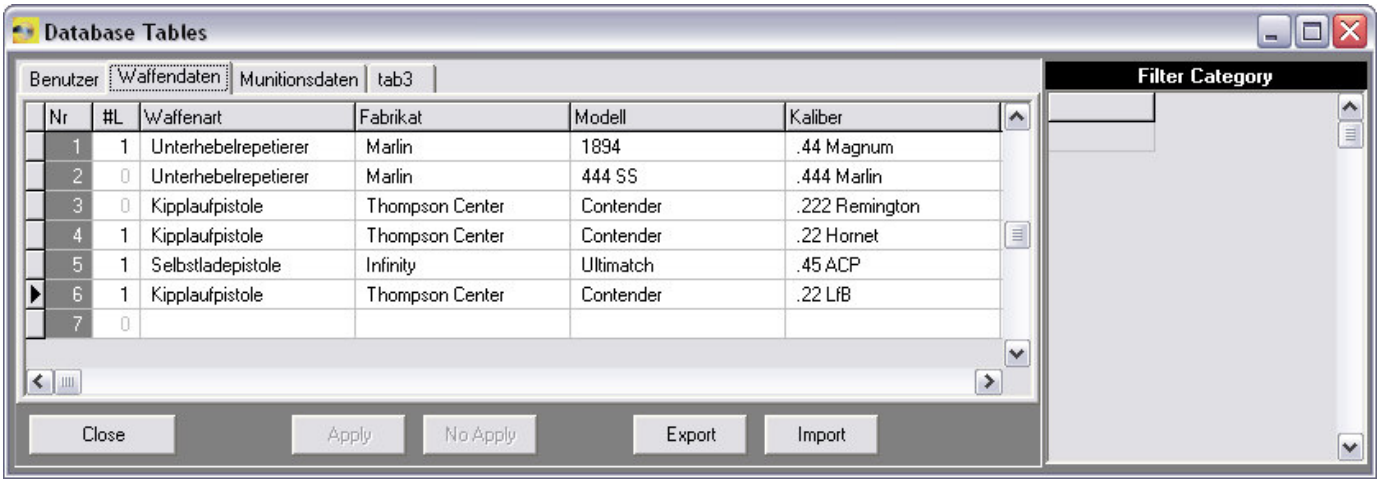
The database window "**Database Tables**" appears.

The database tables contains important information you can assign to your measuring series. This information can be created by the user, imported from data files created by other users or exported for other users.

Entries have to be designed only once and can be assigned to several measurement series.

When you open a new measurement series, you have only to assign the proper database entries to the new series.

In the delivered sample database are the following entries available.

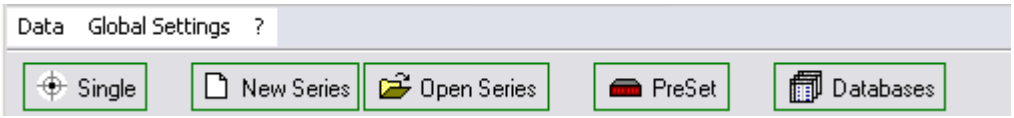


The shown Entries are only samples. You can create a new and custom designed database anytime.

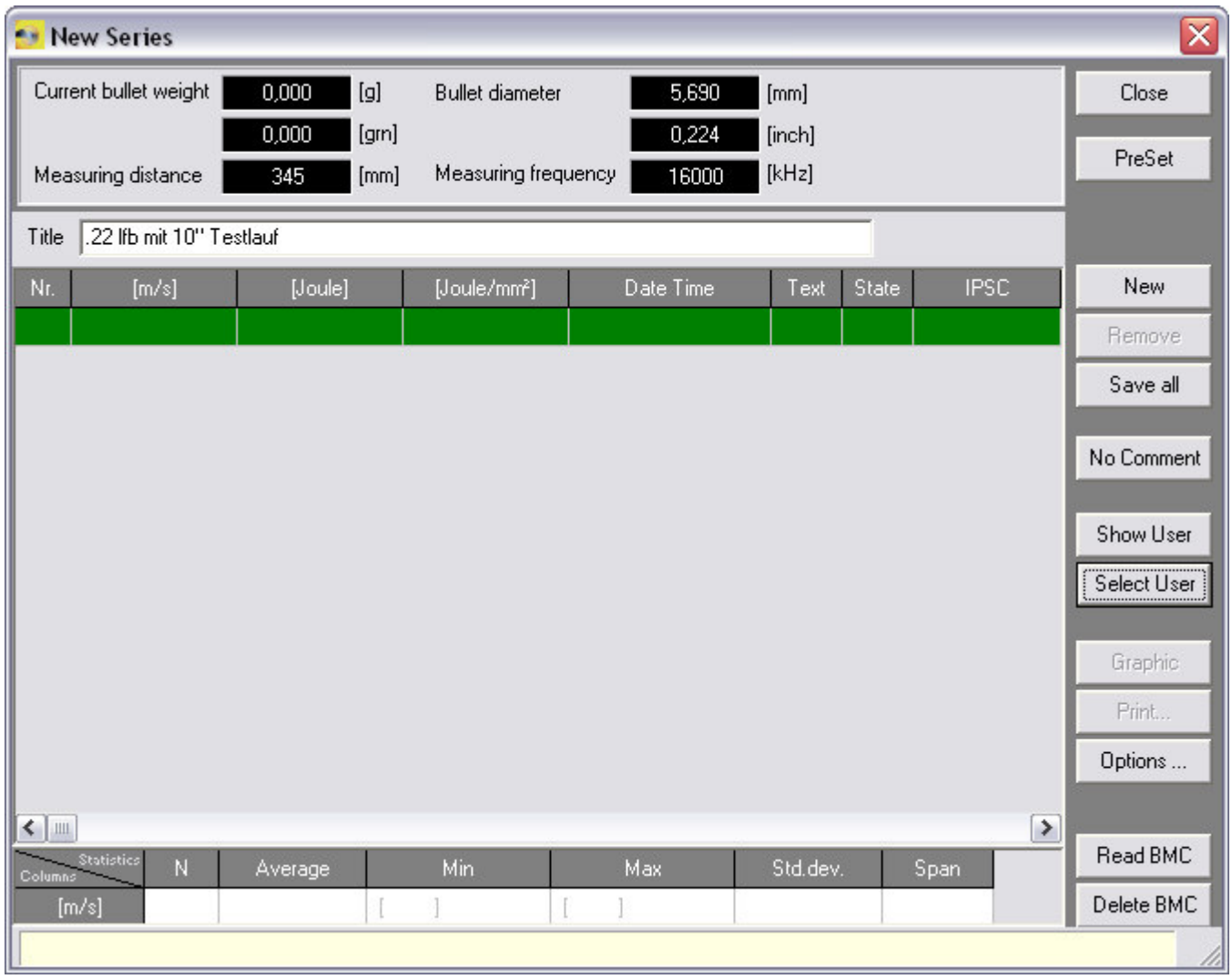
Using the "Database Tables"

Creating a new measuring series

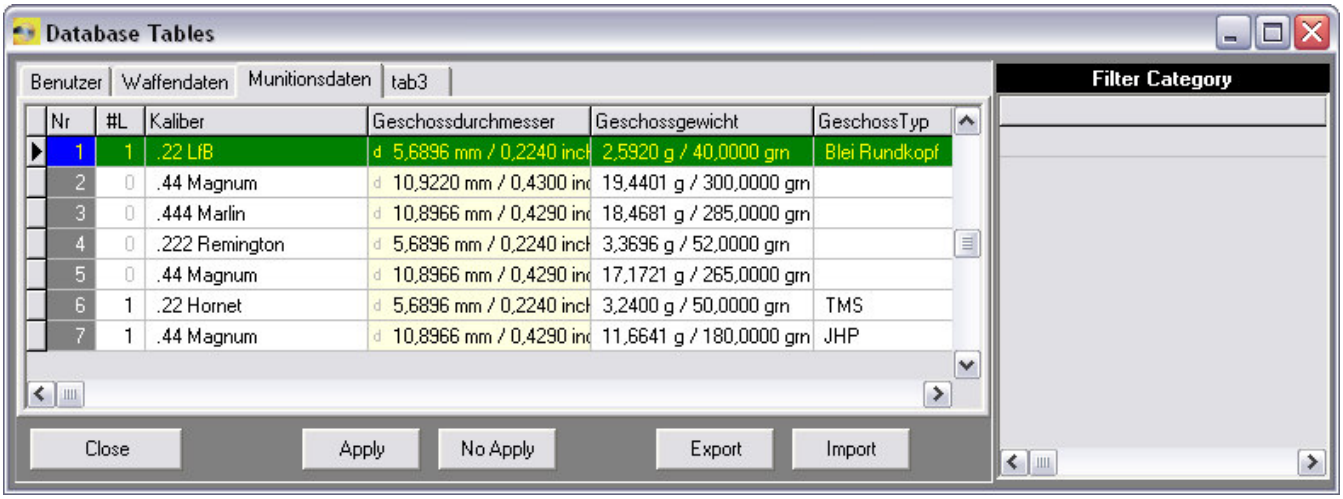
Click the button "**New Series**" beneath the main menu.



A new series window opens. Enter a unique Title for the new series.



Assign the needed database entries to the new series. For this purpose click the "**Select User**" button on the right side of the "**New Series**" window.


Database Tables
Benutzer
Waffendaten
Munitionsdaten
tab3
Filter Category
Nr
#L
Kaliber
Geschossdurchmesser
Geschossgewicht
GeschossTyp
1 1 .22 LfB d 5,6896 mm / 0,2240 inch 2,5920 g / 40,0000 grn Blei Rundkopf
2 0 .44 Magnum d 10,9220 mm / 0,4300 inc 19,4401 g / 300,0000 grn
3 0 .444 Marlin d 10,8966 mm / 0,4290 inc 18,4681 g / 285,0000 grn
4 0 .222 Remington d 5,6896 mm / 0,2240 inch 3,3696 g / 52,0000 grn
5 0 .44 Magnum d 10,8966 mm / 0,4290 inc 17,1721 g / 265,0000 grn
6 1 .22 Hornet d 5,6896 mm / 0,2240 inch 3,2400 g / 50,0000 grn TMS
7 1 .44 Magnum d 10,8966 mm / 0,4290 inc 11,6641 g / 180,0000 grn JHP
Close
Apply
No Apply
Export
Import

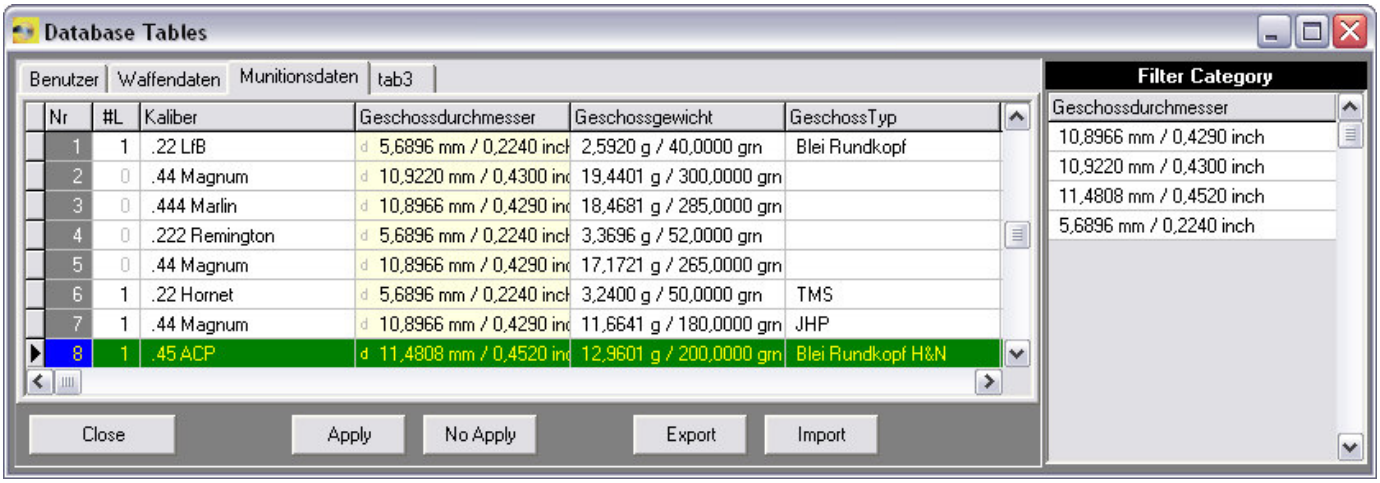
At the top of the window you see the four selection tabs "**user**", "**gun**", "**ammunition**" and "**tab3**".

In the delivered Version you can find the following sections.

User	Information about the user, shooter, customer ...
Gun	Information about the used gun
Ammunition	Information about the used ammunition
Tab3	Empty Database table, customize it!

Sample: Select the tab "**Ammunition**"

Select the dataset #8 (.45 ACP) The selected dataset background becomes green. Assign this dataset now to the new series by clicking the "**Apply**" button.

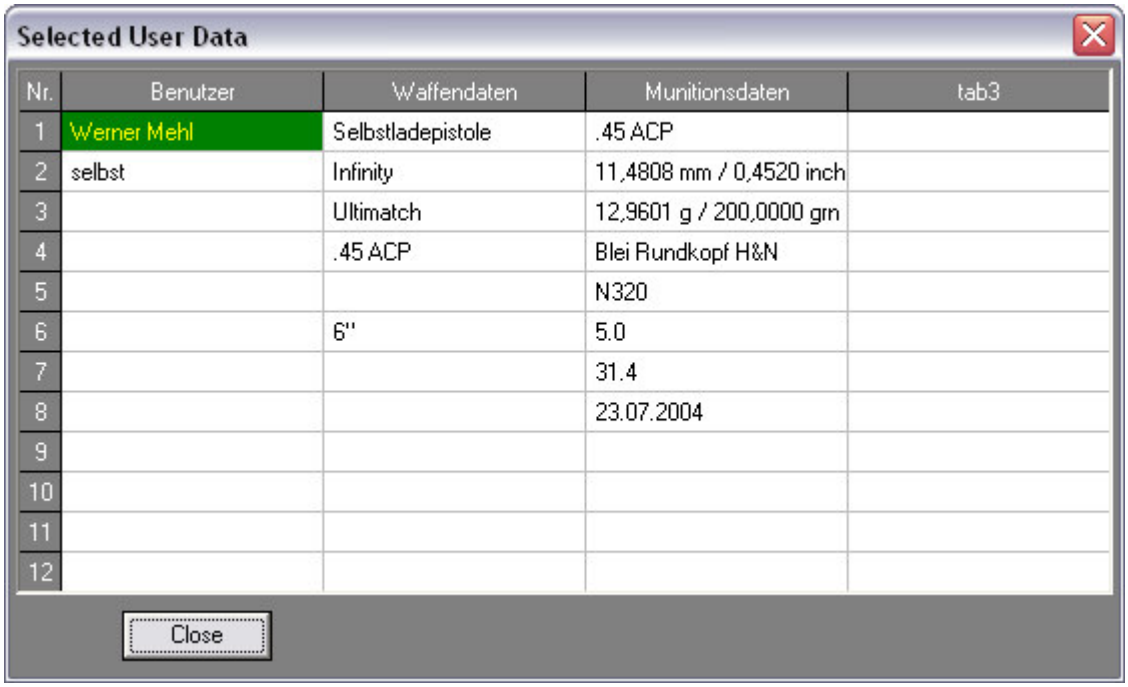

Database Tables
Benutzer
Waffendaten
Munitionsdaten
tab3
Filter Category
Geschossdurchmesser
10,8966 mm / 0,4290 inch
10,9220 mm / 0,4300 inch
11,4808 mm / 0,4520 inch
5,6896 mm / 0,2240 inch
Nr
#L
Kaliber
Geschossdurchmesser
Geschossgewicht
GeschossTyp
1 1 .22 LfB d 5,6896 mm / 0,2240 inch 2,5920 g / 40,0000 grn Blei Rundkopf
2 0 .44 Magnum d 10,9220 mm / 0,4300 inc 19,4401 g / 300,0000 grn
3 0 .444 Marlin d 10,8966 mm / 0,4290 inc 18,4681 g / 285,0000 grn
4 0 .222 Remington d 5,6896 mm / 0,2240 inch 3,3696 g / 52,0000 grn
5 0 .44 Magnum d 10,8966 mm / 0,4290 inc 17,1721 g / 265,0000 grn
6 1 .22 Hornet d 5,6896 mm / 0,2240 inch 3,2400 g / 50,0000 grn TMS
7 1 .44 Magnum d 10,8966 mm / 0,4290 inc 11,6641 g / 180,0000 grn JHP
8 1 .45 ACP d 11,4808 mm / 0,4520 inc 12,9601 g / 200,0000 grn Blei Rundkopf H&N
Close
Apply
No Apply
Export
Import

After assigning the entry to the series, the field "**Nr.**" turns blue and shows that the entry has been assigned.

Alternatively to the "**Apply**" button you can click the wanted entry with the right mouse button and select the "**Apply**" field.

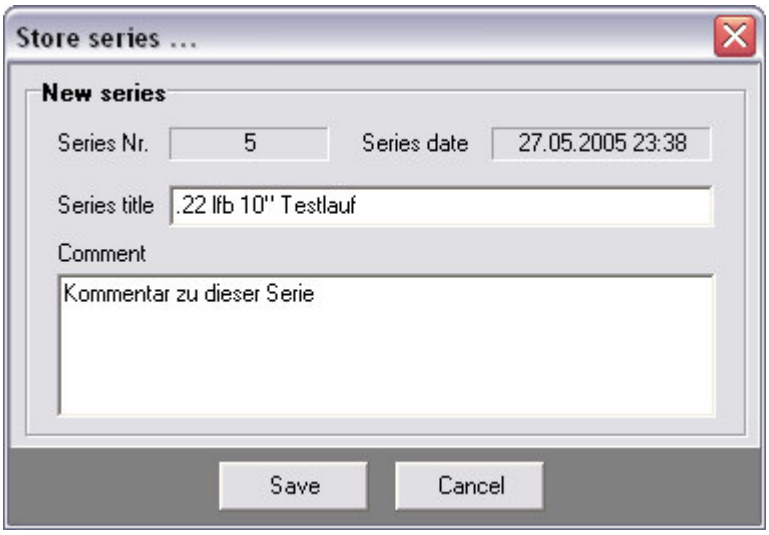
Viewing the selected datasets

On the right side of the series window you see the button "**Show User**". With this button you can have an overview ofthe selected datasets.



Saving the Series

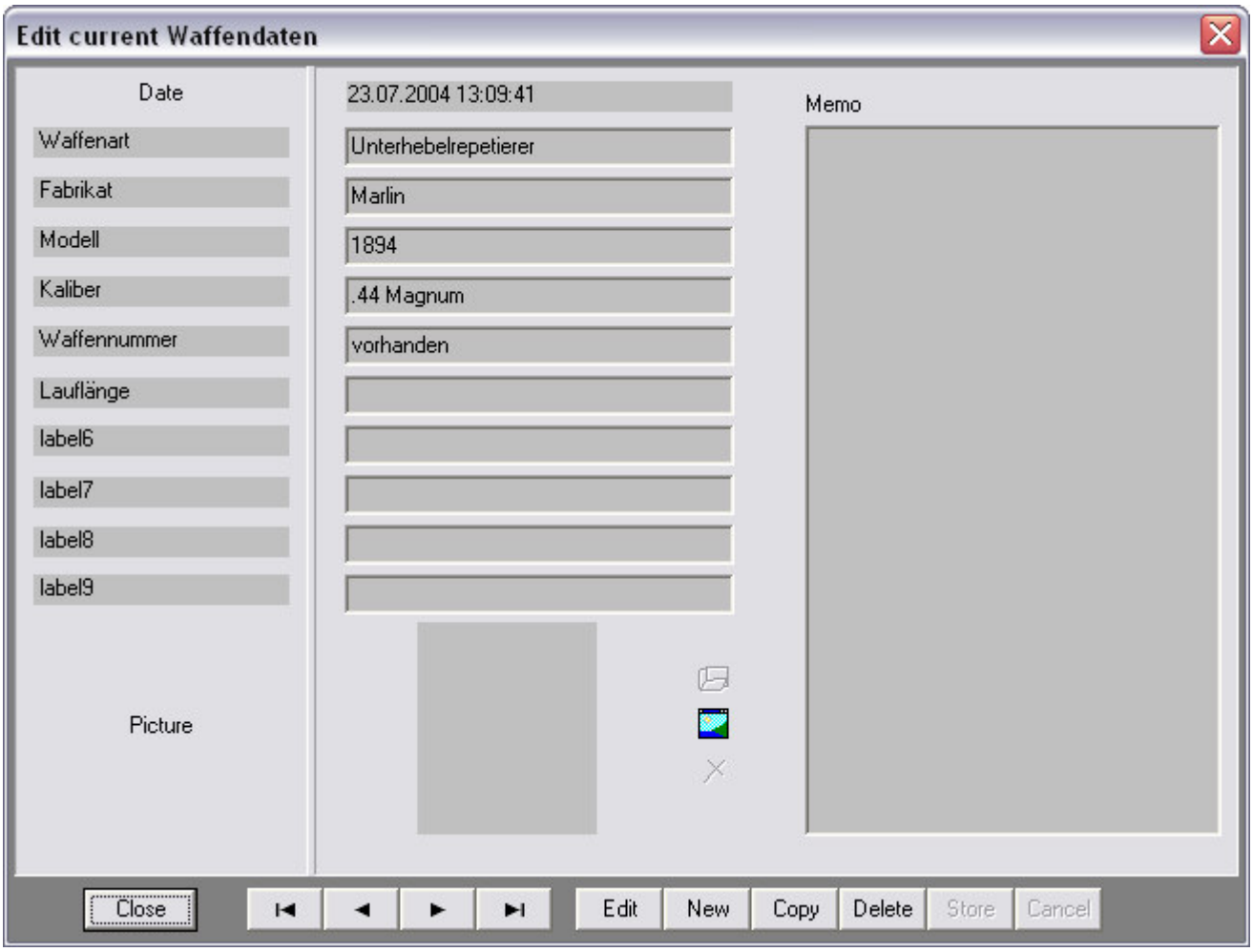
You can store your series at any time. Click on the "**Save All**" button in the series window.



Enter a unique name in the Title field and add a comment to the series when necessary. Save the series finally by clicking the "Save" button. You can reload a saved series at any time to continue a measuring session.

Creating new datasets

Sample: Select the "**Gun**" tab in the database table "**Gun**". Select any dataset with the right mouse-button and select the field "**Edit/New Record**" in the appearing window.



The following buttons are (depending on the program status) available.

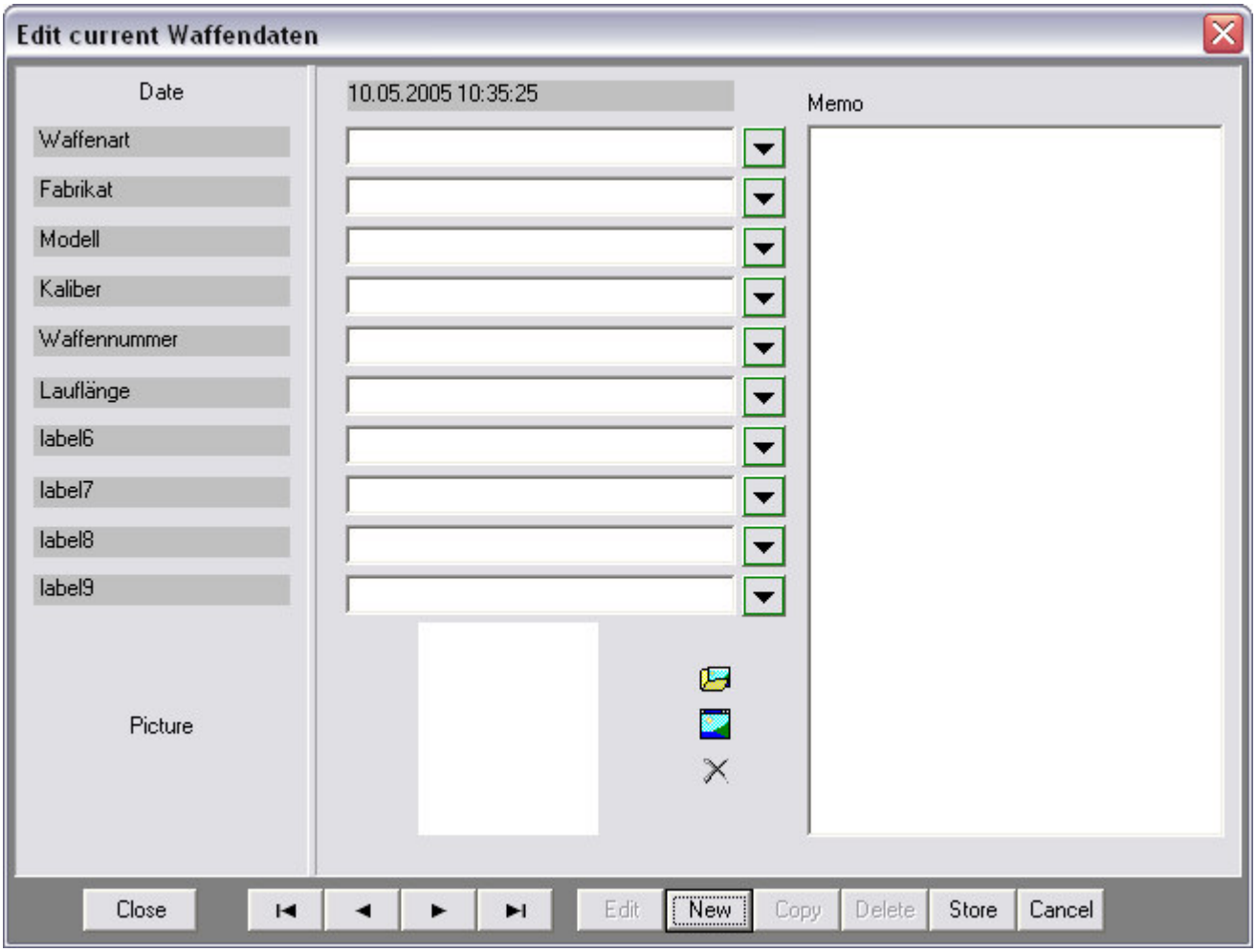
Close	Closes the Window
|<	Jump to the first entry
<	Jump to the previous entry
<	Jump to the next entry
>|	Jump to the last entry
Edit	Opens the edit window (Only when the dataset is not assigned to a series)
New	Creates a new database entry
Copy	Copies the current dataset and opens the edit window
Delete	Deletes the current dataset (Only when the dataset is not assigned to a series)
Store	Saves the current dataset
Cancel	Abandons the current dataset without changing and saving

As long as the dataset has no assignement to a series, the dataset can be edited or deleted by the user. After the dataset is assigned to a measuring series, it is no longer possible to edit or delete this dataset.
Therefore, make sure that your datasets are without errors!

Important note:
After changing a dataset you must "Store" this dataset, or else this dataset is not stored and your work is gone!

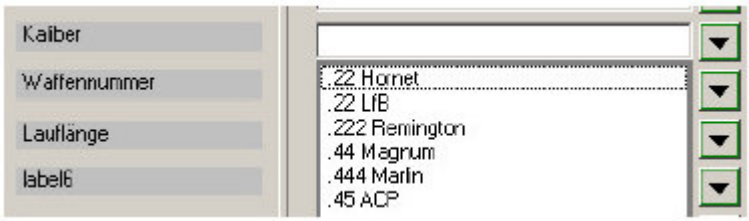
Click the "**New**" button

You see the empty Database template. You can fill out the dataset entries in a way you need it.



When you create new entries in the database, use the arrow down button on the right side of the input field to get already existing entries.

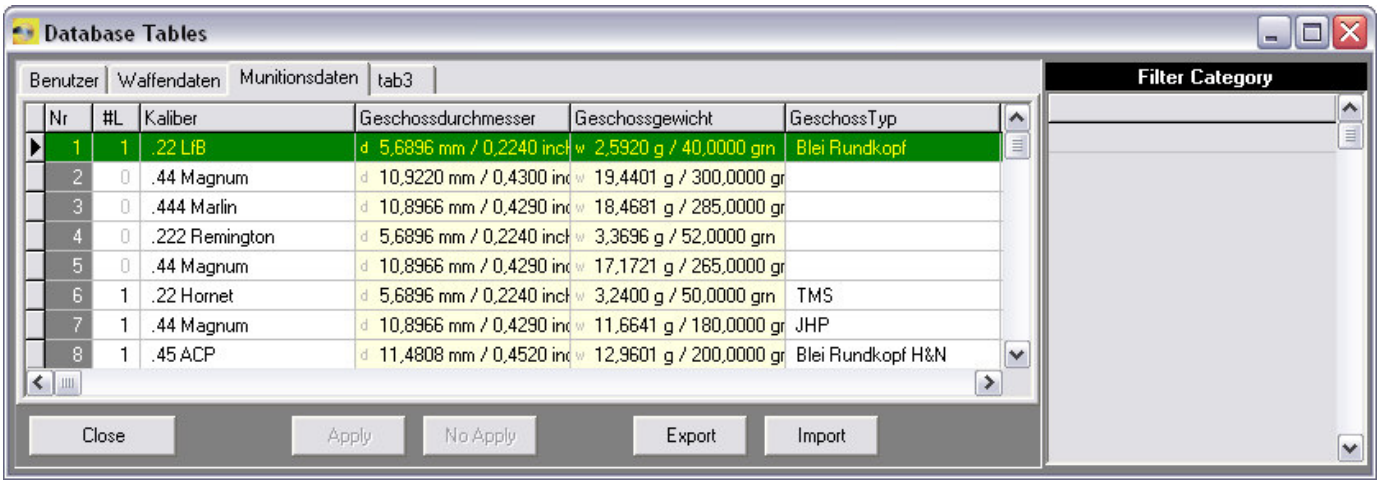
When clicking the arrow buttons a new selector window with all available entries appears.



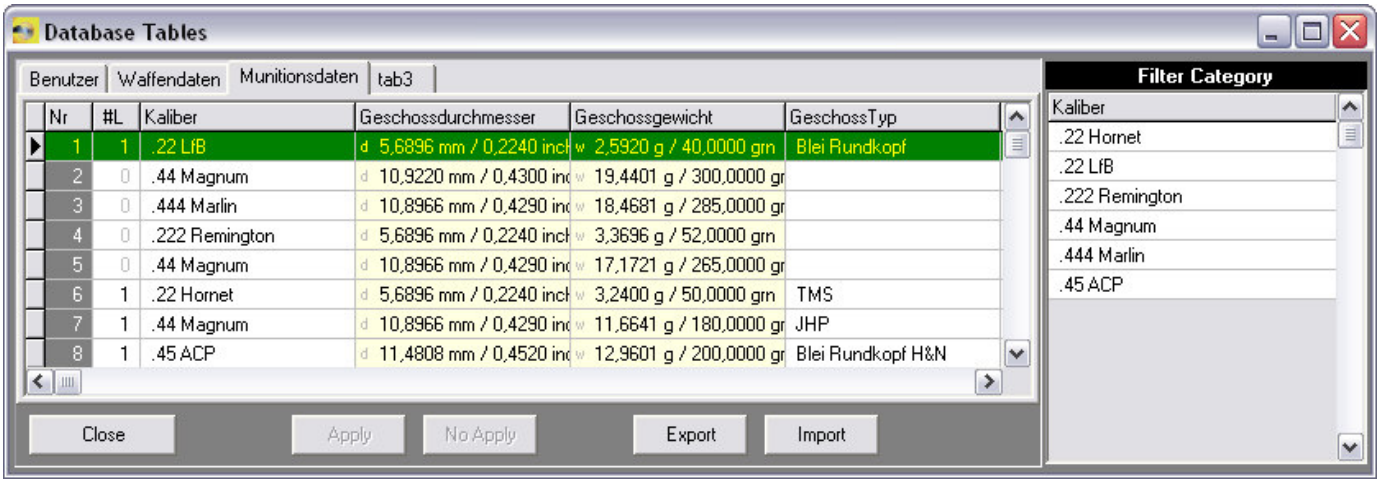
Important Note:
Do not forget to store your dataset! The edited or new created dataset is not saved automatically!

Database tables and Filters (searching datasets in the database)

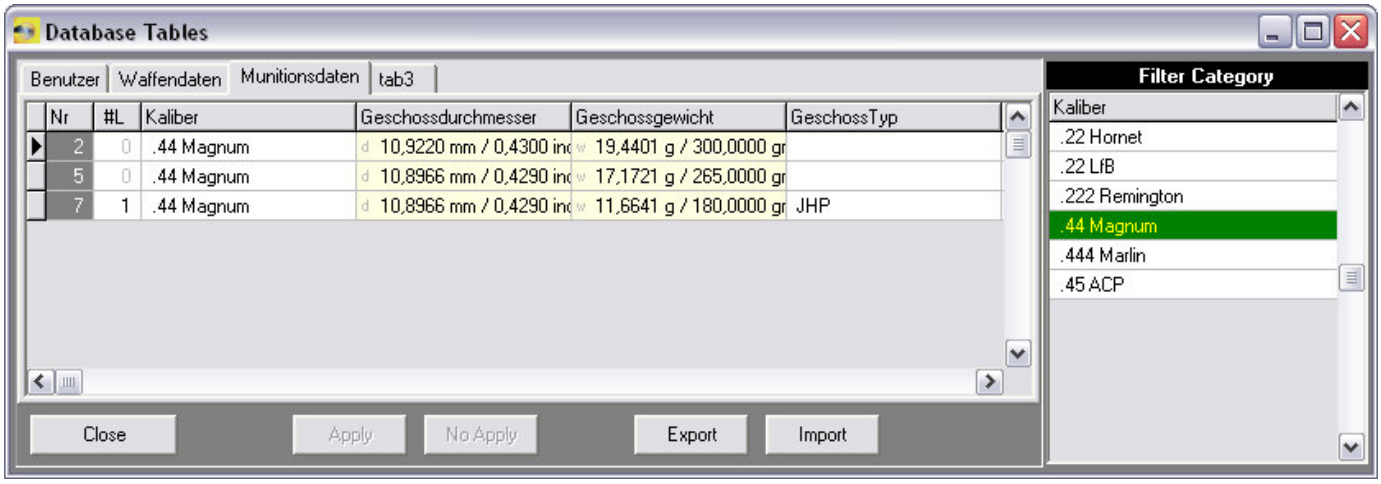
On the right side of the "**Database Tables**" Window you can see the area "**Filter category**". The Filter selections are very helpful when you are searching in a large number of datasets.
Select the "**Ammunition**" database.


Database Tables
Benutzer
Waffendaten
Munitionsdaten
tab3
Filter Category
Nr
#L
Kaliber
Geschossdurchmesser
Geschossgewicht
GeschossTyp
1 1 .22 LfB d 5,6896 mm / 0,2240 inch w 2,5920 g / 40,0000 grn Blei Rundkopf
2 0 .44 Magnum d 10,9220 mm / 0,4300 inc w 19,4401 g / 300,0000 gr
3 0 .444 Marlin d 10,8966 mm / 0,4290 inc w 18,4681 g / 285,0000 gr
4 0 .222 Remington d 5,6896 mm / 0,2240 inch w 3,3696 g / 52,0000 grn
5 0 .44 Magnum d 10,8966 mm / 0,4290 inc w 17,1721 g / 265,0000 gr
6 1 .22 Hornet d 5,6896 mm / 0,2240 inch w 3,2400 g / 50,0000 grn TMS
7 1 .44 Magnum d 10,8966 mm / 0,4290 inc w 11,6641 g / 180,0000 gr JHP
8 1 .45 ACP d 11,4808 mm / 0,4520 inc w 12,9601 g / 200,0000 gr Blei Rundkopf H&N
Close
Apply
No Apply
Export
Import

Select the table header "**Caliber**" with a mouse click.


Database Tables
Benutzer
Waffendaten
Munitionsdaten
tab3
Filter Category
Kaliber
.22 Hornet
.22 LfB
.222 Remington
.44 Magnum
.444 Marlin
.45 ACP
Nr
#L
Kaliber
Geschossdurchmesser
Geschossgewicht
GeschossTyp
1 1 .22 LfB d 5,6896 mm / 0,2240 inch w 2,5920 g / 40,0000 grn Blei Rundkopf
2 0 .44 Magnum d 10,9220 mm / 0,4300 inc w 19,4401 g / 300,0000 gr
3 0 .444 Marlin d 10,8966 mm / 0,4290 inc w 18,4681 g / 285,0000 gr
4 0 .222 Remington d 5,6896 mm / 0,2240 inch w 3,3696 g / 52,0000 grn
5 0 .44 Magnum d 10,8966 mm / 0,4290 inc w 17,1721 g / 265,0000 gr
6 1 .22 Hornet d 5,6896 mm / 0,2240 inch w 3,2400 g / 50,0000 grn TMS
7 1 .44 Magnum d 10,8966 mm / 0,4290 inc w 11,6641 g / 180,0000 gr JHP
8 1 .45 ACP d 11,4808 mm / 0,4520 inc w 12,9601 g / 200,0000 gr Blei Rundkopf H&N
Close
Apply
No Apply
Export
Import

When you have selected the "**Caliber**" header, you can see in the "**Filter category**" section an extract of all available calibers. Now, select the ".44 Magnum" entry in the "**Filter Category**" and get all available database entries in caliber "**.44 Magnum**" immediately.



With this helpful function you can quickly search through a large number of datasets. To show all datasets of the selected database, simply click on any Table header. This search function is available in all tables.

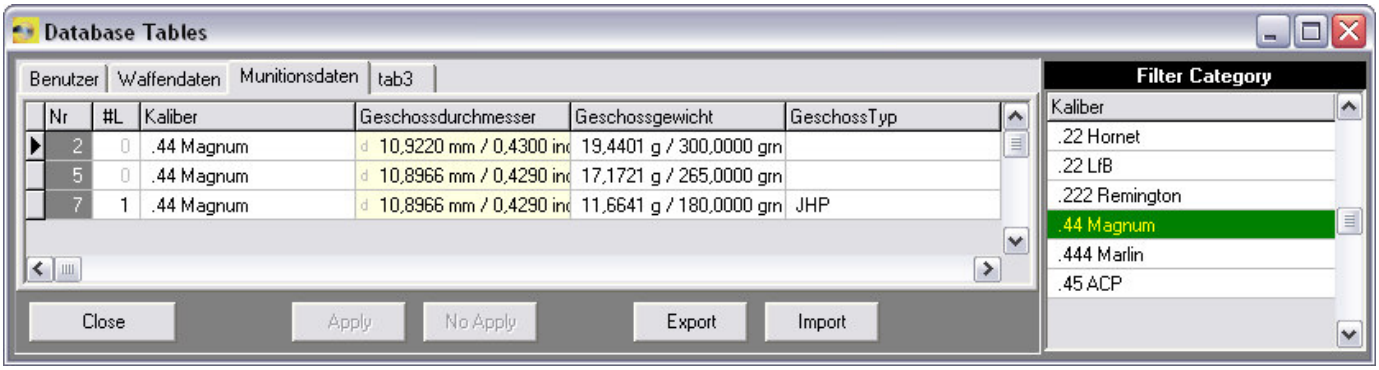
User Database, **Import / Export**

At the bottom of the "**Database Tables**" window you see the two buttons "**Export**" and "**Import**".

With the "**Export**" button you can save an export file with all or selected datasets of the chosen "**Database Tables**".

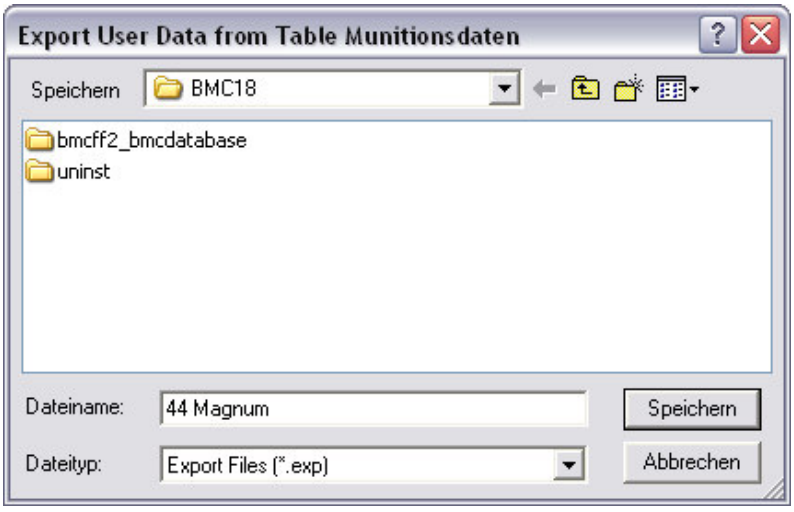
With the "**Import**" button you can import datasets from other users or after a computer problem data recovery.

To export Datasets, use the Filter to select the wanted entries or take simply all available data. The export is possible only for the selected Database table.



Now click the "**Export**" button

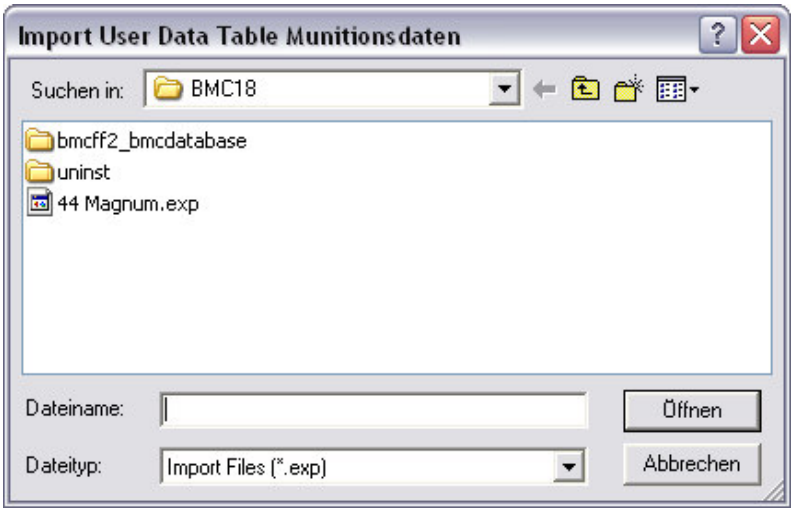
A file selection window appears.



Enter a unique name for the export data and click the "**Save**" button.

Now your first database export is done.

Now click on the "**Import**" button.

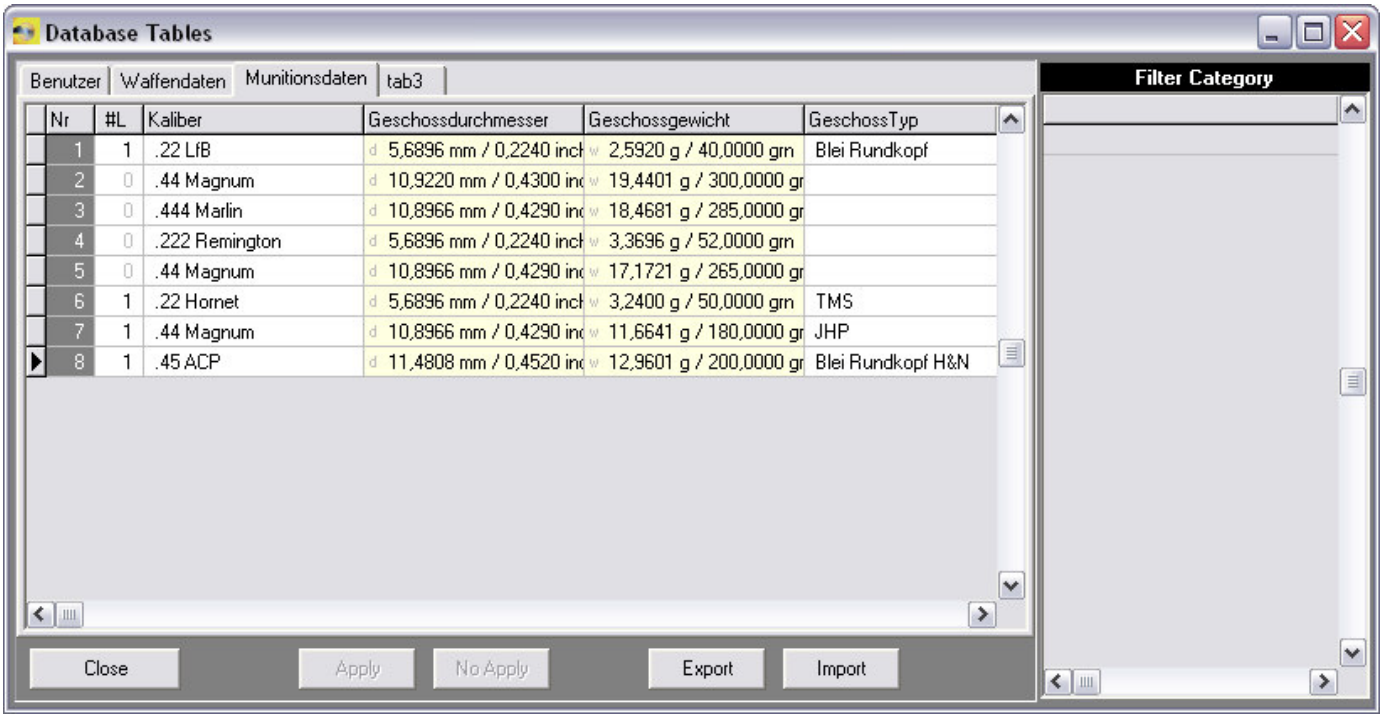


All available .exp files are shown.

Important note:
When you are importing datasets to your own database, all imported datasets are added to your own database.

Changing the identifiers of the database tables

Open the **"Database Tables"**


Database Tables
Benutzer
Waffendaten
Munitionsdaten
tab3
Filter Category
Nr
#L
Kaliber
Geschossdurchmesser
Geschossgewicht
GeschossTyp
1 1 .22 LfB d 5,6896 mm / 0,2240 inch w 2,5920 g / 40,0000 grn Blei Rundkopf
2 0 .44 Magnum d 10,9220 mm / 0,4300 inch w 19,4401 g / 300,0000 gr
3 0 .444 Marlin d 10,8966 mm / 0,4290 inch w 18,4681 g / 285,0000 gr
4 0 .222 Remington d 5,6896 mm / 0,2240 inch w 3,3696 g / 52,0000 grn
5 0 .44 Magnum d 10,8966 mm / 0,4290 inch w 17,1721 g / 265,0000 gr
6 1 .22 Hornet d 5,6896 mm / 0,2240 inch w 3,2400 g / 50,0000 grn TMS
7 1 .44 Magnum d 10,8966 mm / 0,4290 inch w 11,6641 g / 180,0000 gr JHP
8 1 .45 ACP d 11,4808 mm / 0,4520 inch w 12,9601 g / 200,0000 gr Blei Rundkopf H&N
Close
Apply
No Apply
Export
Import

Look to the four selection tabs

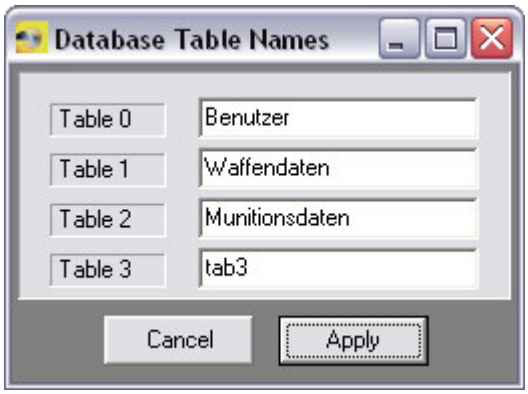
Click to one of these tabs with the right mouse button. A menu with only the "**Rename**" command appears.

Important note:

All "**Labels**", "**Grid Labels**", "**Table Names**", must be the same in the "**report generator**" created printouts. If not, an error occurs for every wrong value.

How to create a complete new database: See the appendix on page 38.

The following Window opens when clicking the "**Rename**" entry of the menu.



In this new window you can change the four "**Table Names**" for your requirements.

When you have changed the "**Table Names**", do not forget the "**Apply**" button to save your changes!

Now let's see how to change the "**Grid Labels**". Click with the right mouse button to the table headers (Grid Labels)

The following context menu appears.

Select the "**Edit Grid Labels**" line from the menu and the Grid Labels edit window opens.

Feel free to change the shown "**Grid Labels**" to meet your requirements.

To save the changed entries click the "**Apply**" button. The "**Cancel**" button abandons edit without changes.

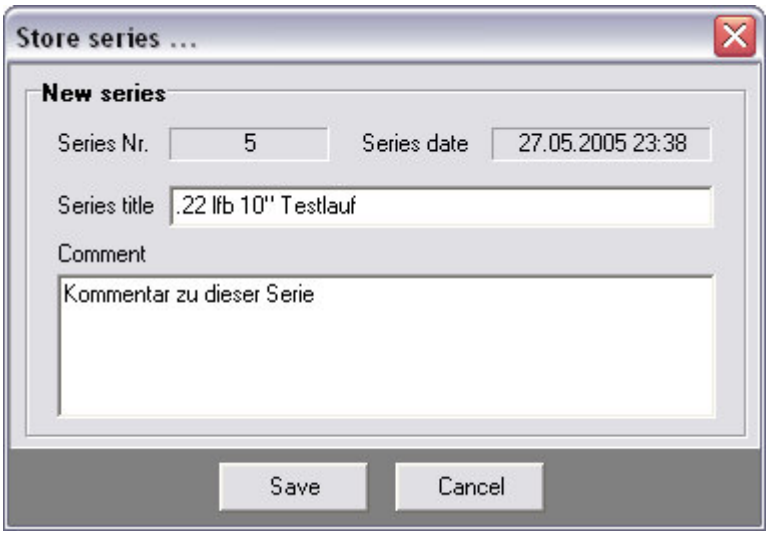
Once again:
The shown Labels and names are only samples. Feel free to change the "**Grid Labels**" to meet your requirements. **Remember that the printout form in the report generator has to be changed to the new names!**

Making measurements

Make sure, that the PVM-21 is **ON** and connected properly to the USB interface.
Start the Software.
After a few seconds the software shows in the status line "**PVM-21 ready**" and the flashing red light changes to green.
Open a "**New Series**"
Make your measurements by shooting through the lightscreen.
After every shot the measurement value is received from the PVM-21 and displayed immediately.

Saving the series

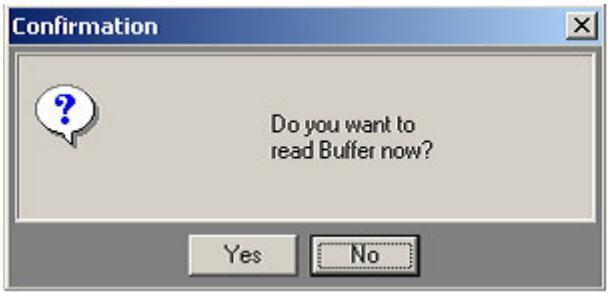
The measurement series can be saved at any time. Click the "**Save All**" button within the series window.



Enter a unique name for the new series and if you want or if it is necessary enter a series comment in the comment field.
Save the series by clicking the "**Save**" button.
The series can re-opened at any time to continue a measuring session.

Read measurement values from the connected PVM-21

1. Make sure, that the PVM-21 is **ON** and connected properly to the USB interface.
2. Open the Software, when it is not open.
3. After a few seconds the software shows in the status line "**PVM-21 ready**" and the blinking red light changes to green. Also, the red indicator led in the PVM-21 front panel start blinking.
4. Open a "**New Series**"
5. Press the "**Read BMC**" button in the series window
6. Confirm the following new window with Yes



After confirming, the measurement values will be read out of the PVM-21 and shown in the series window within a few seconds.

The measurement series can be saved at any time. Click the "**Save All**" button within the series window.

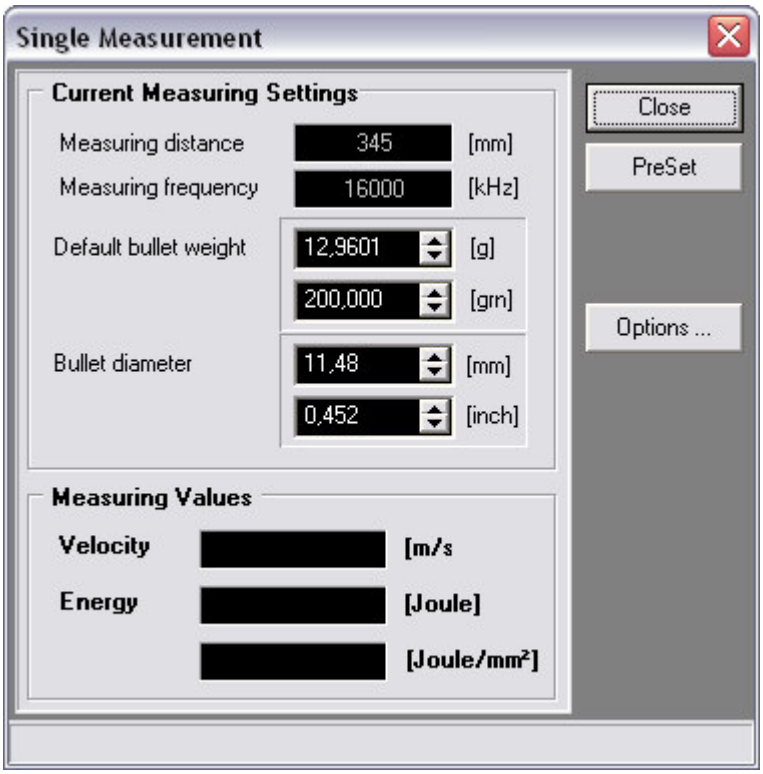
Enter a unique name for the new series and if you want, enter a series comment in the comment field.
Save the series finally by clicking the "**Save**" button.
The series can re-opened at any time to continue a measuring session.

Single measurements

When you need only a few measurements without saving the values to a file, choose "**Single**".

1. Make sure, that the PVM-21 is powered ON and connected properly to the USB interface.
2. Open the Software, when it is not open.
3. After a few seconds the software shows in the status line "**PVM-21 ready**" and the blinking red changes to green.
4. Open the Single Measurement window by clicking the "**Single**" button.
5. The "**Single Measurement**" window appears.
6. After every shot the measured value is received from the PVM-21 and displayed immediately.
   Make your measurements by shooting through the lightscreen.
   Enter the bullet weight in gram or grain to get the energy in Joule. Every new value overwrites the old one.

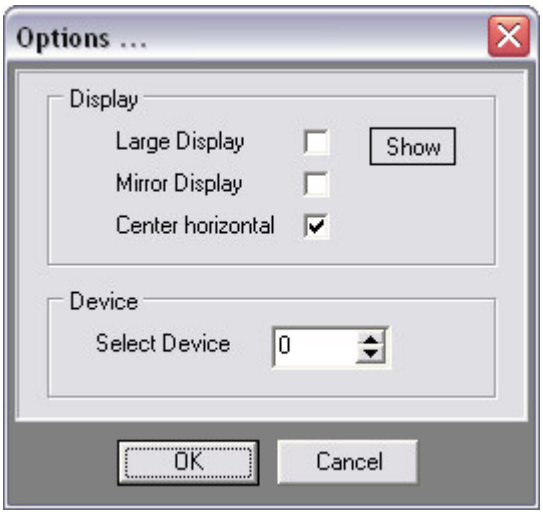
Important note: **Single measurements cannot be saved!**



The "**Close**" button closes the "**Single Measurement**" window without any question.

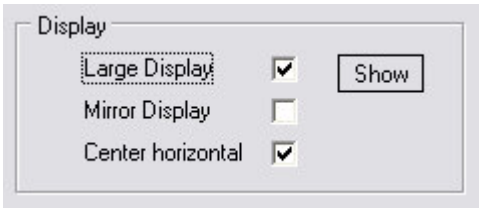
The "OPTIONS" Window

The "**Options**" window can be opened from three different areas in the software. They are the "**Series Window**", the "**Single Measurement**" Window and from the main menu "**Global Settings / Options**"



Display (Remote display on laptop or PC monitor)

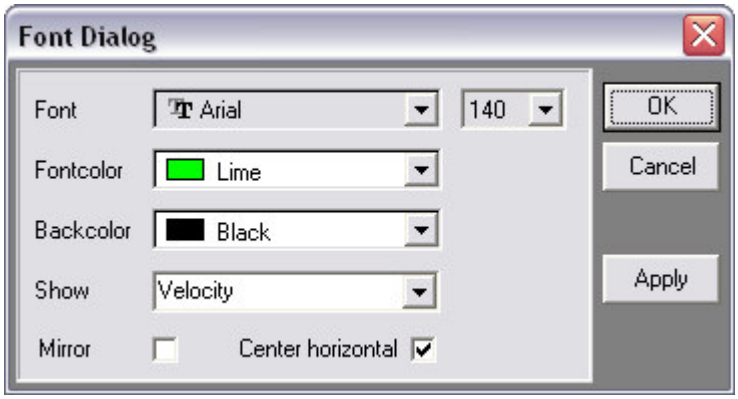
Configure the (Remote) Display "**Options**" in the following window:



The Remote Display can be used to show measurement values at a large distance or display the IPSC factor at an IPSC match while testing the ammunition. After every shot the selected value will be displayed on the larger remote display.

Large Display	Activates the Remote display
Mirror Display	Mirrors the Remote display
Center Horizontal	Centers the Remote display in the center of the screen.
Show	Opens the Remote Display for the setup

The following "**Remote Display**" parameters can be changed



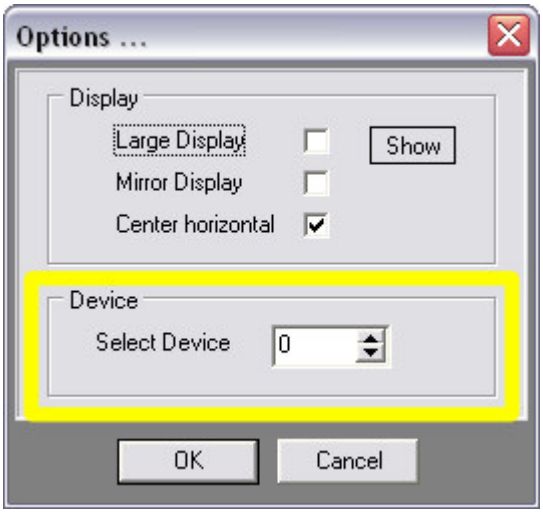
Font	Setting Font and font size
Font color	Setting the font color
BackColor	Font - Backgroundcolor
Show	Displays the value on the monitor of a laptop or PC.
Mirror Display	Converts remote display to a mirror image
Center Horizontal	Centers the Remote display in the center of the screen.

Apply	Take over the new Remore Display setup without closing the window
Cancel	Abandons the window without making any changes to the Remote Display.
OK	Take over the changes in the Remote Display setup and closes the window.

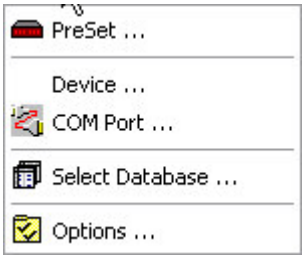
Device

With the "**Device**" address the user can control different PVM-21 units with the IR2C Infrared Remote Control unit. Also the software can select different PVM-21 units to read out stored measurement values.

When only one PVM-21 is in use, the "**Device Address**" should be 0 (zero). The "**Device Address**" **0** (zero) is a broadcast address. This means that every PVM-21 unit, no matter what device number it has, is able to understand your commands. Only when more than one PVM-21 are in use should you select here the device number of the PVM-21 unit you want to work with.



A further device setting can be found in the **Main Menu**.

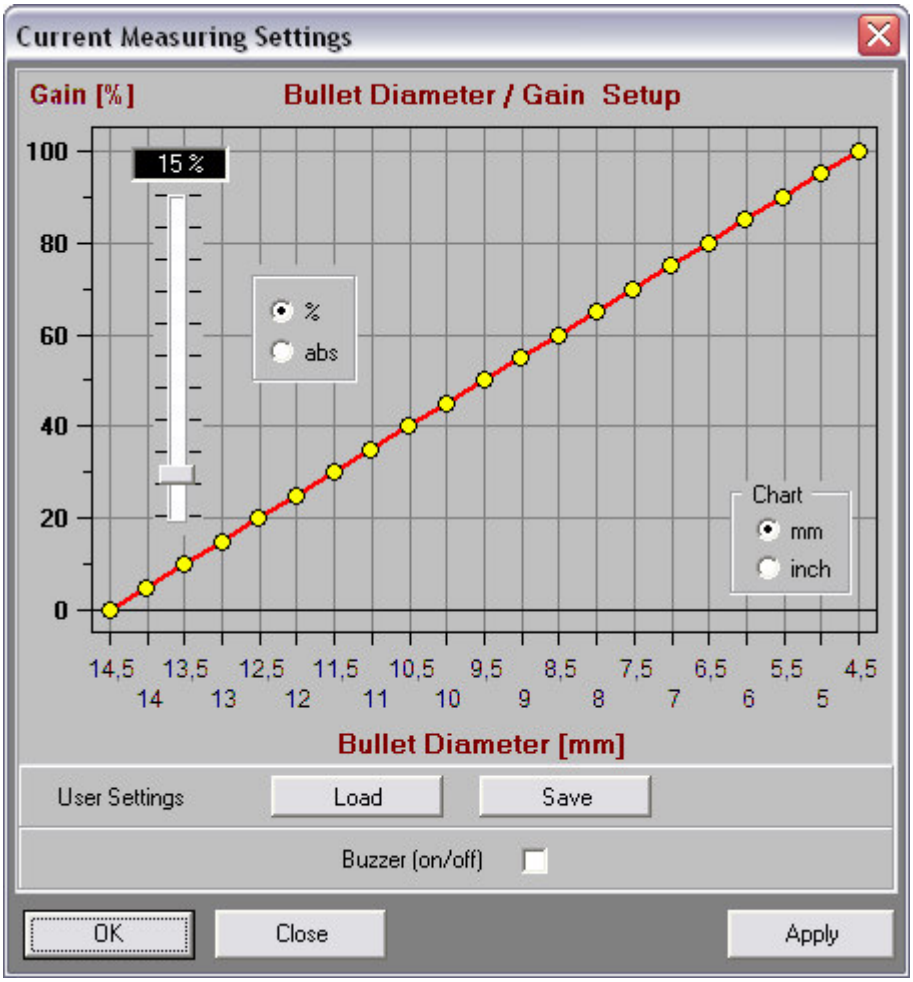


Here you can change the "**Device Address**" of the connected PVM-21. The "**Device Address**" can also be changed with the Infrared Remote Control Unit.

With the "**Send**" button, the new address is written to the PVM-21. The PVM-21 acknowledges the change with the display message [**SETUP-OK**]. The software is switched to the new device number after sending it to the PVM-21.

The lightscreen amplifier Gain Setup

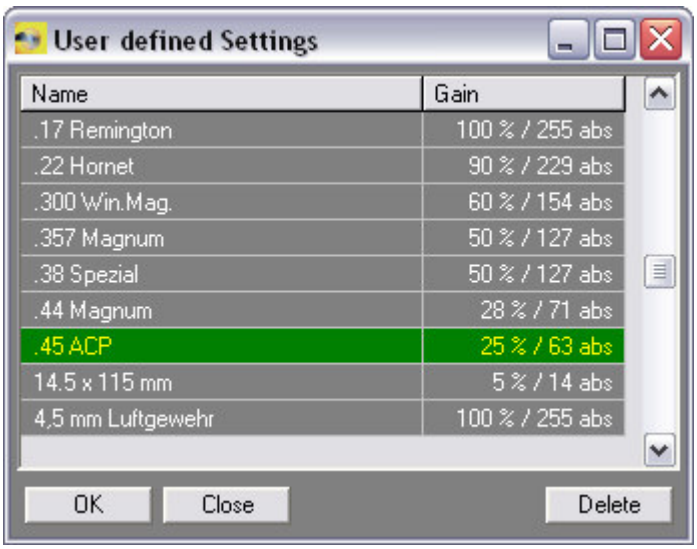
Preset



With the "**Preset**" you are able to adjust the lightscreen very accurately to the used bullet diameter.

The Display is reversible from % (percent)value to Abs. (absolute = Byte value 0-255).
With "**Apply**", the gain setup is transferred to the PVM-21. The Gain Window remains open.
When clicking the "**OK**" button, the gain setup is transferred to the PVM-21 and the window closes.
The PVM-21 acknowledges with the display message [**SETUP-OK**].

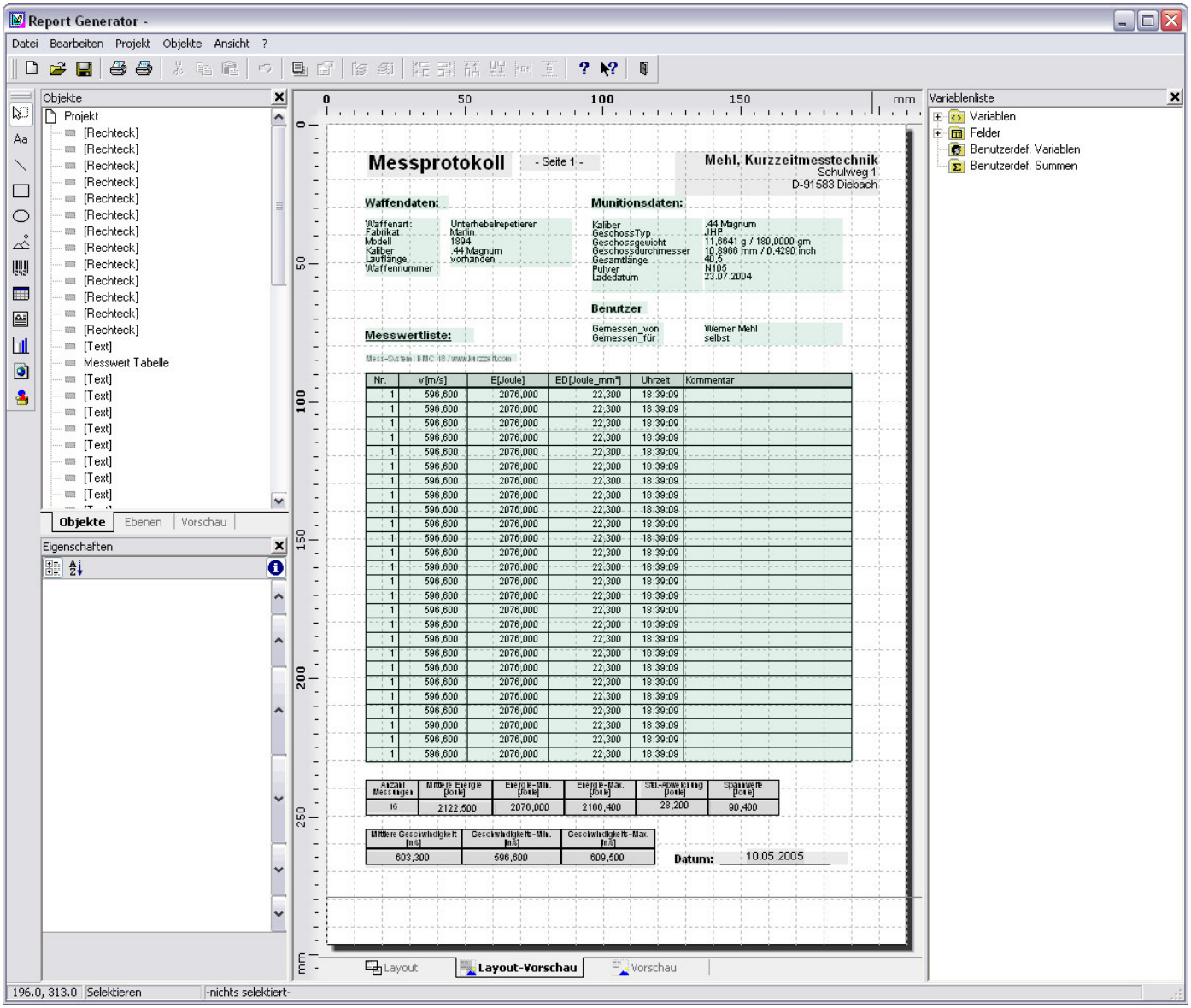
Your setups can be stored with a name, e.g. (.45 ACP) and reloaded by the "**Load**" button.



Creating forms

The user is free to create forms and printouts with the built-in report generator. A sample is delivered with the software.

Open the report generator from the **Main Menu** by selecting **Data > Report Generator**.



A detailed description is available by pressing the **F1** key on the PC-keyboard when the **Report Generator** is started.

Terminate Program

To terminate the Software all windows up to the series browser must be closed.

Main Menu functions
A short description and overview

Data

New Series
Create a new measuring series

Open Series
Reopens an existing series

Databases
Create and edit databases

Column Configuration
Edits the column configuration in the series window, create own calculations with the Formula Editor.

Report Generator
Create and edit printouts

Report Print
Executes printing of measurement values

Single Measuring
Create single measurement values without saving

Exit
Exit the program.

Global Settings

Pre-Set
Change lightscreen amplifier setup.

Device
Setup the Device Address.

ComPort
Selects the Com Port used.

Select Database
Select the Database you want to work with.

Options
Configure the Remote Display and select the Device Number used

Info
Opens the user manuals

Keyboard shortcuts

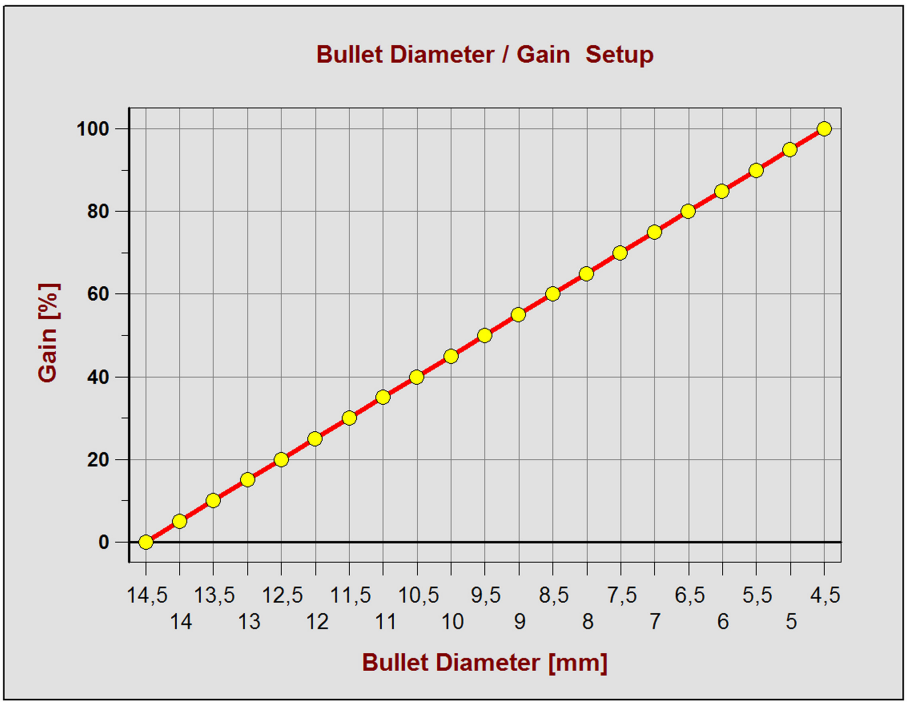
Ctrl + N
Create a new series

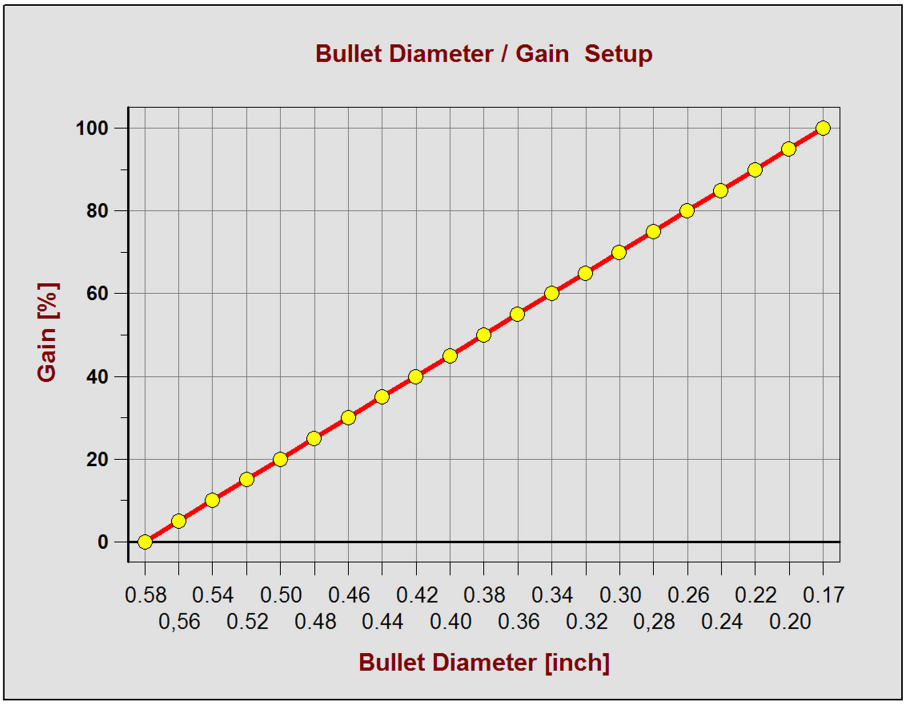
Ctrl + O
Open an existing series

F3
Start the single measurement window

Gain values versus Caliber

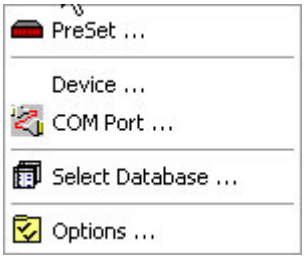
Use the pictures below to see the context between Bullet diameter and Gain Setup.



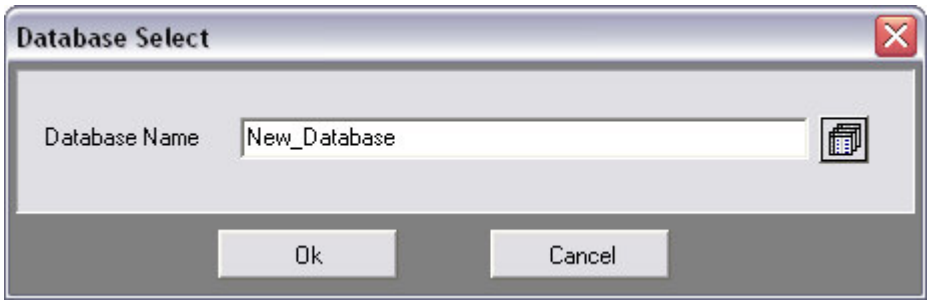


Creating a new database

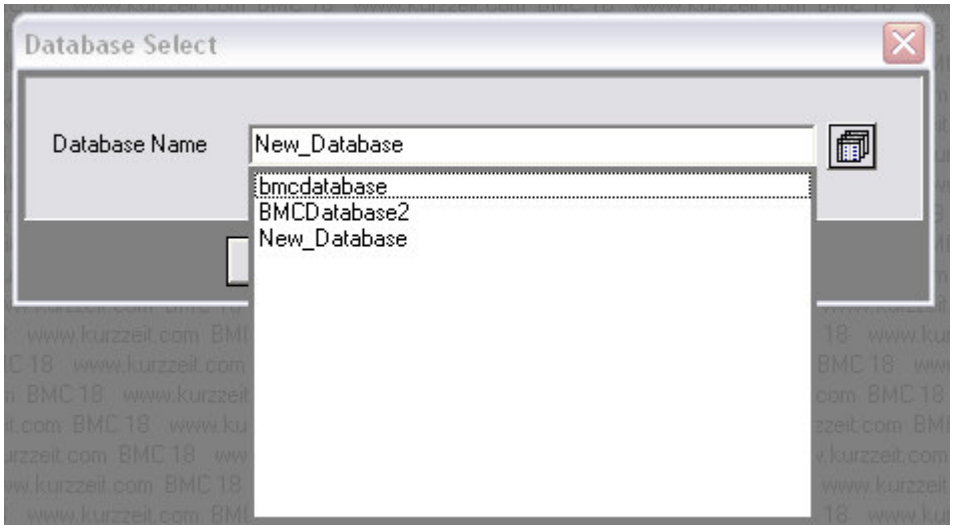
From the Main menu, select [**Global Settings**] and then [**Select Database**]



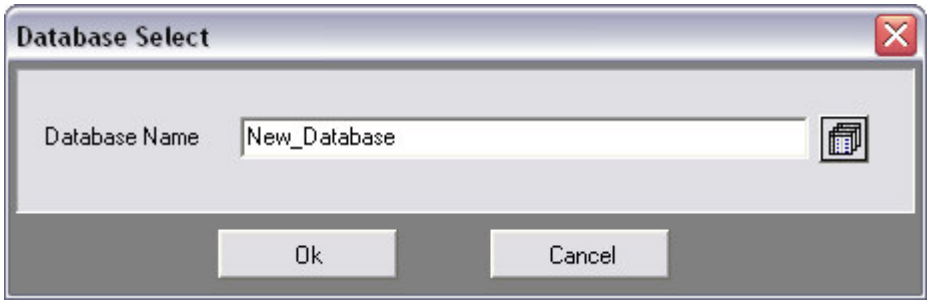
Enter the Name of your "**New Database**" and confirm with the **OK** button.



Reopen now the [**Select Database**] window and select your new database from the shown list.

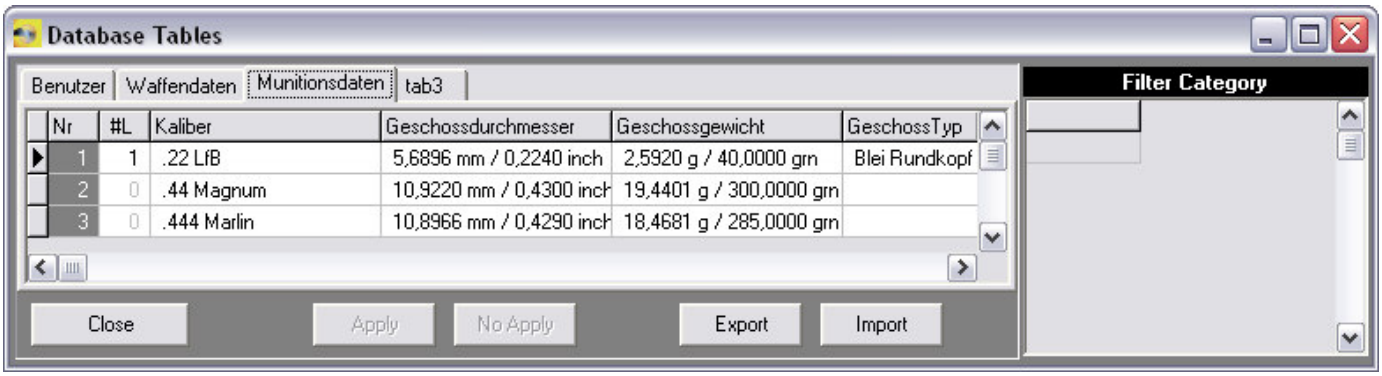


Confirm your choice with the **OK** button



Because of the freely definable contents of the databases, the software does not know in which column the user has placed the "**Bullet Weight**" and "**Bullet Diameter**". The user has to assign the proper values to the user specified columns. (e.g. col. A for the Bullet energy)

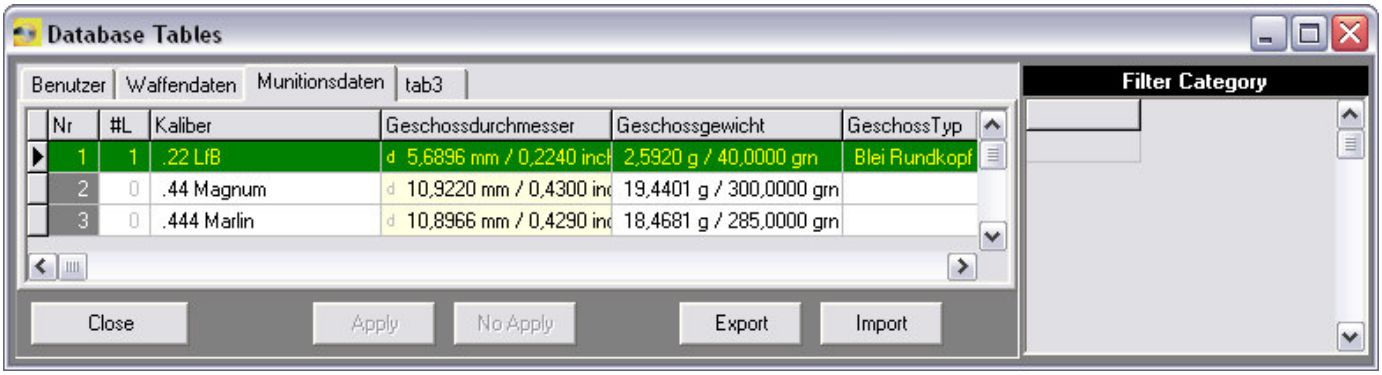
Therefore, open the **"Database Tables"**



Select the column of the "**Bullet weight**" by clicking the column - header with the right mouse button.

When the following context menu appears,

select the "**Use as Bullet Weight**" entry with the left mouse button. The "**Bullet Weight**" column has become yellow and you can see also the small "**w**" (for weight) at the left side of the column.



Now the software knows the origin of the bullet weight and can use it.

You has to do the same procedure for the "**Bullet Diameter**". (Use as Series Diameter)

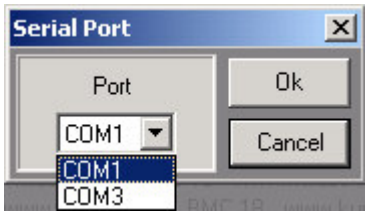
In case of mistake or type error you can repeat the procedure at any time.

VCP - Virtual **C**om **P**ort

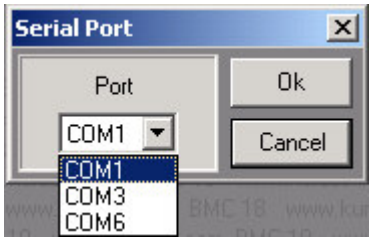
The acronym VCP means **V**irtual **C**om **P**ort and is a software created serial interface (RS 232). Virtual means that the Interface is not a hardware interface but a software interface created by the USB driver. After the PVM-21 USB driver has been installed, this USB driver opens the VCP **only** when the PVM-21 is connected to the computer.

The following sample shows the available com ports before and after connecting the PVM-21 to the USB port of the computer.

without PVM-21



with PVM-21



You can notice, that an additional com port (com6) is available after connecting the PVM-21 to the computer. This com port **must** be used for the PVM-21 (**Global settings / ComPort**).

Please note: When you want to read data from the PVM-21:

1. The PVM-21 must be powered up and connected to the USB interface of the computer before starting the software.

2. Do not disconnect the PVM-21 from the computer when the software is running! An error appears.
3. Do not disconnect the PVM-21 from the power supply when the software is running, an error appears.

Faults

The Software is not able to connect the PVM-21

Possible source of trouble

Wrong Com Port selected (see VCP above)

Device Address from software is not equal to the PVM-21

Relief: When only one PVM-21 is in use, the **Device Address** should be set to 0 (zero). The **Device Address 0** (zero) is a broadcast address. That means that every PVM-21 unit, no matter what device number it has, is able to understand your commands. Only when more than one PVM-21 are in use should you select here the device number of the PVM-21 unit you want to work with.

Wrong Baudrate (PVM-21 has generally 19200 Baud)

Relief: Open the file "**BMC18App.ini**" and check in the [**GLOBAL**] area the first entry. This value must be 19200 Baud

[GLOBAL]
baudrate=19200

This value is fixed, therefore it is no way to change it in the software.

The software shows different measurement values than the PVM-21

Possible source of trouble:

Measuring Base in the file "**BMC18App.ini**" is wrong

Relief: Open the file "**BMC18App.ini**" and check in the [**GLOBAL**] area the entry

distance=345.

This value must be 345 (mm). Change this value when different.

Measuring frequency in the file "**BMC18App.ini**" wrong.

Relief: Open the file "**BMC18App.ini**" and check in the [**GLOBAL**] area the entry

frequency=16000

This value must have 16000 (kHz). Change this value to 16000 when different.

Remember, the PVM-21 is a precision measuring instrument. Always follow the suggested operating instructions. Doing so will insure years of reliable and accurate service.

Always follow the commandments of firearm safety. Be aware of your surroundings at all times when making measurements. Be aware of your target and the direction of the muzzle of the firearm. Changing your concentration from the target to instrument must be done with safety in mind.
Place the lightscreen at a distance that will allow you to shoot through the screen with assurance that you will not "kill" the lightscreen. Never place the lightscreen closer than 2 meters or 7 feet.

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